

GERMANY

A General and Regional Geography

by

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*With 32 Illustrations
and 124 Maps and Diagrams*



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PREFACE

VARIOUS SPECIAL difficulties have presented themselves in the writing and final arrangement of this book.

First, Germany is today one of the greatest problems of international relations and problem number one in British foreign policy. Germany is the home of geopolitics and there are many works that criticize the German *Geopolitiker* and re-evaluate the German problem on non-German standards. I have dealt with this theme in my *German Lebensraum* in its geographical aspects and I do not propose to return to it in detail in this book, although some of the material of the *German Lebensraum* will be found in these pages.

Second, Germany has suffered great changes since 1939. Its boundaries have changed since 1938 and are not yet fixed, and it is politically divided into two federal republics, each of which contains a number of partially new component states. Cities and towns have been obliterated—though it is uncanny to witness the revival of apparently normal living in their rubble. Production and trade were disorganized and reduced at the end of the war and have suffered great changes through the dismantling policy and through the barriers of new frontiers. It has been necessary, therefore, to refer primarily to the pre-war conditions of population and production, with correctives where necessary and practicable for the post-war period.

Third, since this purports to be a work on geography, it is essential to be clear as to the conceptual framework upon which it is based since this obviously affects the whole question of selection and presentation. Geography has now reached the stage where works dealing with major areas require rigorous selection of material and scope. Geographers need to intensify their lines of attack to specific problems of man-land relationships. We must build from the particular—the small area—to the general. Germany, like France and Britain, has a formidable geographical literature, and important geographic problems have been tackled in one area, rural or urban, but not in another. Which is the more important for the advanced student and for the researcher—a general overall presentation of the geography of a country or the specific illustration of some of the great variety of problems, whether “systematic” or “regional”, to which the geographer has so much to contribute? It is a remarkable

fact, and one that deserves the strongest emphasis, that our German colleagues produced a tremendous amount of first-class research in spite of the Nazi regime and, moreover, were just as disquieted by the geopoliticians in their midst as we were. Their work continued during the war and ambitious programmes of nation-wide research by geographers are now taking shape. How shall one present this material in one volume? There are three alternatives. A "systematic approach" would take the various geographic aspects of the country as a whole and illustrate each from selected special studies. A "regional approach" would present the varied geographic aspects of each section of the country as a "synthesis". This assumes that all the aspects have been studied in each area, which, of course, is not the case. A single regional study, even in broad outline, demands a volume in itself, for the varied aspects of land and society in any area can only be understood in terms of their historical development, not merely in their present-day correlations. Moreover in a group of regional studies, many of the facts and arguments call for much repetition from one area to another. A third alternative is a compromise in which a general is combined with a regional section, in which case both have to be reduced in length. I have adopted the compromise. In consequence, no special geographical problem, whether physical or cultural, and whether general to Germany or particular to a part of it in a small area, has been presented as thoroughly as the available geographical researches permit and demand.

Finally, there is the question of the selection of sources. There are several first-class works in German on Germany. Probably the best plan would be to translate one of these, for no matter how carefully and independently a non-German may work on an original presentation, he will certainly come out with a product in many ways inferior to the native one. German works, it is of interest, are all predominantly regional. An important exception is the small book on *Deutschland*, written by Friedrich Ratzel in 1898 and reaching its seventh edition in 1943, edited by Hans Bobek. Here is a classic work, beautifully written, with a conceptual framework that gives clarity and direction to modern geography. It ranks in my view as a classic with Vidal de la Blache's *Tableau de la Géographie de la France*, and should be read by every student of the geography of Germany. It will serve also as an essential and long overdue corrective to the generally held view that Ratzel was a "naïve environmentalist". It is high time that Ratzel's work was re-evaluated, independently of Miss Semple's *Influences of Geographic Environment*. The best regional geography is probably the Norbert Krebs' series of three volumes: N. Krebs, *Südwesten*, H. Schrepfer, *Nordwesten*, and N. Brandt, *Nordosten*. I have drawn heavily on these three works. To a lesser extent I have used G. Braun's *Deutschland*. The two volumes on *Das*

Deutsche Reich in the *Handbuch der Geographischen Wissenschaft*, that was completed during the war and is entirely regional, did not reach my hands until this book was complete. Similarly, in the actual writing of the book I have deliberately not made reference to De Martonne's *Europe Centrale*, which will surely be far more accessible to the English reader than German works. Thus, my work is drawn almost exclusively from German sources. It is based on an extensive bibliography, field studies, and the standard German topographic map series. By far the most useful map, with almost complete coverage of Germany, is the map of the *Reichsamt für Landesaufnahme*, on a scale of 1 : 200,000. This I have used as a base for the terrain and region maps, that form the framework of reference for the whole of this work.

Geography is an old-established field of study in Germany. Its modern development began with two of the great figures of German scholarship, Alexander von Humboldt and Carl Ritter, both of whom died in 1859, the one an explorer, scientist and diplomat, the other an "arm-chair geographer", a great bibliophile, and a distinguished Professor of Geography in the University of Berlin. The subsequent growth of geography was led by such men as Ratzel, Peschel, Von Richthofen, Hettner, Kirchhoff, Supan, Köppen, Penck, and Gradmann. The active promotion of research on the geography of Germany commenced in 1882 with the formation of the Central Commission for Scientific Geography (*Zentralkommission für wissenschaftliche Landeskunde*). This was an informal organization with a central committee and six (enlarged to eighteen in 1921) regional committees. The objective of this commission was to "encourage, further and direct in every way geographical studies of Germany". A number of handbooks (*Handbücher der Deutschen Landeskunde*) that dealt with special aspects of the geography of the whole of Germany were published under its auspices. Many of the volumes planned by F. Ratzel, the chairman of the commission, did not appear because of lack of funds, but there appeared the *Geologie von Deutschland* by R. Lepsius, *Deutschlands Pflanzengeographie* by O. Drude, and *Die Gletscher der Ostalpen* by E. Richter. These general works were intended to serve as a scientific basis for more detailed studies of smaller areas. Ratzel encouraged the preparation of intensive studies of smaller areas, to be published as monographs, an aim that fitted in closely with the attention given to the study of the local area—*Heimatkunde*—in the teaching curriculum. It was to this end that the commission, in addition to encouraging such work and assisting its publication, sponsored the foundation of the *Forschungen zur deutschen Volks- und Landeskunde*. Founded by R. Lehmann, the first chairman of the commission, this series contains 171 separate works that fall into forty-five volumes. It is a veritable mine of information on the geography of Germany.

This tradition is now being carried on in large measure by the *Amt für Landeskunde*, that was established in April 1941. Dr. Meynen, its director, is now editing a record of current geographical work, called the *Berichte zur Deutschen Landeskunde*, the first volume of which appeared in 1941. He is also editing, with the co-operation of several colleagues, the research series that, since 1935, has been retitled *Forschungen zur Deutschen Landeskunde*. In addition to establishing a thorough bibliography and map collection of the geography of Germany, Meynen is organizing the preparation of detailed geographies of *Kreise*. These works are to be called *Kreisebeschreibungen*. Under the auspices of the *Amt* a threefold programme is being undertaken with the co-operation of geographers throughout western Germany. This includes a minute study of the natural units of Germany; a corresponding study of the agricultural units; and a study of the socio-economic units as a basis, among other things, for the re-definition of local government areas. All these maps are to be prepared on a standard scale of 1:200,000. The first study of natural units is complete and it is likely that by the time this book is in print a generalized map on a scale of 1:500,000 will be in print. My terrain studies, reproduced in this book, were drawn independently on a similar basis, and have very similar results.

During the war years German energies were directed to the waging of war, but it is remarkable that much academic work continued and that much geographical literature of outstanding value appeared in this period. This, indeed, was also the situation throughout the Nazi period. Many of the old masters have passed away in the last ten years—Braun, Friedrichsen, Hassert, Haushofer, Hettner, Köppen, Sapper, Krebs, Penck, Gradmann and Ule; younger men have died or were killed during the war—Geisler, Dörries, Schrepfer, Credner and Waibel. The geographers of today are reassembling their material, building their departments, and grappling with the problems of teaching a new generation of students with an outlook fundamentally different in many ways from that of the pre-war student. The content and approach of this book have been influenced throughout by the works and ideas of these men with whom I had much friendly contact in the 'thirties and whom it has been a pleasure to meet again during a visit in 1949. In particular I wish to express my thanks to Professors Carl Troll, Gotfried Pfeifer, Hans Mortensen, and Dr. Emil Meynen, for their kind hospitality and for many stimulating discussions. Dr. Meynen in particular has assisted in the collection of recent literature and we are especially indebted to his *Berichte* and *Geographisches Taschenbuch* for current material and information. Recognition and thanks are also due to Mr. Robert Hippert, my graduate assistant at the University of Syracuse, for help in the preparation of the maps.

The following guides are necessary in reading this book, especially as regards the detailed regional studies. A good atlas is essential. The best is the *Sydow-Wagner Methodischer Schul-Atlas*. If not available, the next best choice would be the *Schweizerischer Mittelschulatlas, Jubiläumsausgabe 1948*. If neither of these are accessible, then the *Oxford Advanced Atlas* has a map of Germany on a scale of 1:3 m. and this can be supplemented by the maps in this book. Second, it is essential to refer constantly to the ten detailed maps of Germany (post-1945) on a scale of 1:4 m. These are Figs. 4, 11, 12, 13, 18, 19, 27, 31, 54, 55. The student will find it a great help to enlarge the rectangles on Fig. 62 (scale 1:6 m.) to the same scale as these maps. On this same trace, the boundaries of the physical units (Fig. 13) may also be quickly drawn and this trace can then be superposed on the other maps in this series. Third, we mention the detailed series of terrain and region maps. These are on a scale of 1:1,250,000. These sheets are the rectangles shown on Fig. 62. In order to make each of these maps more intelligible, the terrains may be shaded or coloured as follows: 1, 2, 3-4, 5 (leave unshaded), 6, 7, 8-10, 11, 12. Finally, in Part VI we have indicated the population of the towns in brackets after their names. The figures are in thousands, for 1939 and 1946. We have used the 1939 figures for the small towns with under 50,000 people. Illustrations are taken from E. Diesel, *Das Land der Deutschen* and Von Creuzburg, *Kultur im Spiegel der Landschaft*. The sections of fourteen sheets of the 1:100,000 series (*Karte des Deutschen Reiches*), shown on Figs. 108-121, were kindly selected by Dr. E. Meynen, head of the *Amt für Landeskunde*.

Several German works have appeared since going to press that are of great importance in the regional geography of Germany. These are H. Bobek, *Südwestdeutsche Studien*, H. Blume, *Das Land Hessen und seine Landschaften*, and O. Schlüter, *Die Siedlungsräume Mitteleuropas im frühgeschichtlicher Zeit*, publications in the *Forschungen zur Deutschen Landeskunde*; and W. Müller-Wille, *Westfalen*, Münster.

ROBERT E. DICKINSON,
Syracuse, June, 1951.

CONTENTS

<i>Chapter</i>	<i>Page</i>
1. INTRODUCTORY: THE PROBLEM OF GERMANY IN ITS GEOGRAPHIC ASPECT	2
Part I. THE LANDS	
2. RELIEF	17
The development of the land-forms, 17. Coasts and seas, 23. Northern Lowland, 29; surface deposits, 29; main relief units, 34. Central Uplands: Central Germany, 37; Southern Germany, 40; Bavarian Alps, 47. Appendix: Geological tables, 50.	
3. CLIMATE, SOILS AND VEGETATION	53
General, 53. Climate: temperature, 54; rainfall, 56; river regimes, 60, regional variations of climate, 61. Climatic tables, 64. Soils, 67. Natural vegetation, 72. Table of vegetation in post-glacial times, 80. The Natural Regions of Germany, 84.	
Part II. THE PEOPLES	
4. THE GROWTH AND SPREAD OF THE GERMAN PEOPLES	88
The phases of settlement: the areas of tribal settlement, 88; the Age of Forest Clearance, 91; colonization of the trans-Elbian lands, 92; the period 1400-1800, 93; modern growth, 96. Post-war changes, 98; demographic trends, 99.	
5. THE DISTRIBUTION OF POPULATION	106
The distribution of population in 1830, 106. The distribution of population in 1930, 110. Changes in population distribution 1870-1930, 119.	

<i>Chapter</i>		<i>Page</i>
	Part III. THE HABITAT	123
6.	FIELD, FARM AND VILLAGE	125
	Field systems, 125. Types of rural economy about A.D. 1800, 128. Rural settlements in the west German lands, 132; in northern Germany, 134; in southern Germany, 138. Rural settlements in the east German lands, 139. Post-medieval rural settlement forms, 143. The classification of rural settlements, 144. The farmstead, 148. Appendix: types of rural settlement, 155.	
7.	TOWN AND ROUTE	156
	Urban beginnings in the west German lands, 156. The West German lands in the late Middle Ages, 162. The eastern lands of German colonization, 166. The Renaissance and Baroque town (1500-1800), 169. The German conurbations, 170. Functional types of town, 173. The urban site and plan, 176. Types of historic town, 182. The phases of growth of the modern town, 186. Limits of the urban area, 188.	
	Part IV. ECONOMIES	190
8.	GENERAL ECONOMIC DEVELOPMENT AND ECONOMIC REGIONS	192
9.	AGRICULTURE AND AGRICULTURAL REGIONS	202
	Land uses: forest, 202, heath, bog and barren land, 207; arable land, 207; grassland, 208; crops, 210; livestock, 211. Types of rural economy, 211. Agricultural regions, 213. Appendix: Land Use by Geographic Units, 223.	
10.	INDUSTRY AND INDUSTRIAL REGIONS	227
	Historical background, 227. The Cartel in the Heavy Industries, 229. Power: coal, 233; lignite, 233; oil, 235; electricity, 236. Metals: iron ore, 237; non-ferrous metals, 239. The Major Industries: Iron and steel production, 240. Heavy engineering industries, 241. Light engineering industries, 242. Chemical industries, 245. Rubber industry, 247. Textile industries, 247. Glass-making, 248. Paper-making, 249. Leather industry, 249. Miscellaneous industries of general distribution, 249.	
11.	COMMERCE AND COMMERCIAL REGIONS	251
	Historical background, 251. Traffic arteries: railway, roads, waterways, 255. Ports, 260. Some major commodity movements, 265. Ports and their hinterlands, 274. Commercial	

<i>Chap.</i>	regions: Pomerania and East Prussia, 280; Nordmark, 280; Brandenburg, 282; Lower Saxony, 282; Lower Rhineland, 282; Middle Rhine or Rhine-Main, 282; Southwest, 283; Bavaria, 284; Silesia, 284; Central Germany, 285.	<i>Page</i>
--------------	--	-------------

12.	THE FOREIGN TRADE OF GERMANY	286
	General, 286. Overseas trade, 288. Germany's European trade, 292. Selected international commodity movements: coal, coke, iron, 296. German coal in international trade, 299. Trade in agricultural products, 303.	

Part V. NATION AND STATE 305

13.	THE POLITICO-CULTURAL GROUPS OF THE GERMAN PEOPLES	306
	The unity of the German lands, 306. The ethnic character of the German peoples: language, racial characters, religions, 312. Medieval dukedoms and marches, 322. Late medieval groupings: States, Town Leagues and <i>Kreise</i> , 326. Politico-geographical groups in 1700 and 1815, 329. Historical Politico-cultural groups, 322. The Reich and its political divisions, 339.	
14.	REGIONALISM IN MODERN GERMANY	343
	Regionalism of political attitudes, 343. Prussia, 344. Saxony, 350. Bavaria, 352. The Rhinelands, 357. Modern regionalism, 361.	

15.	POTSDAM GERMANY, 1945-52	367
	Allied Occupation, 1945-52, 367. Western Germany, 371. Eastern Germany, 374. The Population Problem, 378. Inter-regional Trade: pre-war trade, 384, post-war trade, 386. Coal and Steel in the International Setting, Schuman Plan, 388, pre-war production and trade, 389, post-war trends, 390. Place of Germany in Europe, 391. Appendix, 394.	

Part VI. LANDSCAPE AND REGION 400

16.	LANDSCAPE AND REGION	402
	Landscape unit areas, 402. Landscape elements in western Germany, 404. Natural terrain types, 407. Terrain Areas: Three examples, 411. Physical units of Germany, 416. Human or functional units, 418. An example: Wurttemberg, 421. Minor politico-cultural unit areas, 425.	

*Chapter**Page*

17. THE RHINE MASSIF 428
 General, 428. Rhine Gorge, 440. Koblenz Basin, 441. Trier, 447. The Eifel and its borders, 442. The Moselle Valley, 447. The Bergisches Land, 448. Elberfeld-Bermer, 449. Hagen, 449. The Sauerland, 450. Rothaargebirge, 451. Siegerland, 451. Westerwald, 452. Hunsrück, 455. Taunus, 456. Limburg Basin, 458. Eastern border of the Massif, 458.
18. THE LOWER RHINELANDS 460
 General, 460. The Lower Rhine Plain, 461. Towns, 466. Cologne Lowland or Bay, 466. Bonn, p. 468. Cologne, 469. Düsseldorf, 472. The Aachen district, 473. The Westphalian Lowland, 475. Münster, 476. Small towns on the Hellweg, 477. The Ruhr district, 478. The Cities of the Ruhr district, 485. Greater Duisburg, 485. Essen, 486. Bochum, 488. Dortmund, 488. Oberhausen, 489. Gelsenkirchen, 489. Post-war situation, 490.
19. LOWER SAXONY AND HESSE 493
 General 493. Northern Lowland: Heath and Moor of the East Frisian and Ems-Hunte Geest, 494. Lüneburg Heath and the Altmark, 497. Lüneburg, 500. Weser Uplands, 501. The Börde, 506. North Harz Foreland, 506. Magdeburg, 507. Brunswick, 508. Hanover, 509. Hesse, 511. Vogelsberg, 512. Rhön, 513. East Hesse Depression, 514. Wetterau, 514. West Hesse Depression, 514.
20. THE NORTH SEA PORTS: HAMBURG, BREMEN AND EMDEN 516
 Hamburg, 516. Medieval development, 516. Modern development, 521. The growth of modern Hamburg, 524. Bremen: site and development, 527. The growth of Bremen, 530. Emden, 533.
21. SOUTHWEST GERMANY 537
 General, 537. The Upper Rhine Plain, 539. The border uplands, 539. The Plain proper: Terrains, 542. The Plain Proper: Settlement, 544. The Rhine-Main urban complex, 551. Frankfurt-am-Main, 552. Black Forest, 556. Kraichgau, 559. Spessart and Odenwald, 560. Pfälzer Wald (Haardt), 562. Saar-Nahe Uplands (Pfälzerbergland), 563.
22. THE SOUTH GERMAN SCARPLANDS 564
 The Swabian or Neckar Scarplands: The Land: Gäue, Berge, Filder, 564. The Settlement, 566. Stuttgart, 568. The Franconian Platform (Platte), 568. Würzburg, 574. Upper Werra, Main Valleys, 575. The Franconian Scarp and the

<i>Chap.</i>	Middle Franconian Basin, 576. Nuremberg, 577. The Franconian Alb, 578. The Ries, 579. The Swabian Alb, 580. Oberpfalz or Upper Palatinate Lowland, 581. Bohemian Forest, 582. East Bavarian Highlands, 583. Frankenwald, 583. Fichtelgebirge, 583.	<i>Page</i>
23.	THE BAVARIAN PLATEAU	585
	General: Physical 585. Settlement, 587. The Swabian Lower Bavarian Terrace Lands, 588. The Tertiary Hill country or the Lower Bavarian Uplands, 588. Regensburg and Passau, 589. The Iller-Lech Plateau, 590. Ulm and Augsburg, 592. The Inn Terraces and the Munich Plain, 592. Munich, 593. The Upper Swabian—Bavarian Uplands, 595. Morainic country of Upper Bavaria (Oberbayern), 595. Between the Iller and Lech Valleys, 596. In the Lake Constance Area, 597. The Bavarian Alps, 599. Allgäu Alps, 599. Bavarian Alps east of the Lech, 600. Berchtesgaden Land, 601.	
24.	THE NORDMARK	603
	Schleswig-Holstein, 603. Western Marshes, 604. Central Geest, 605. The Eastern Morainic Upland, 606. Rural Settlements, 607. Urban Settlements: Schleswig and Flensburg, 609. Kiel, 610. Lübeck, 611. Mecklenburg-Vorpommern, 614.	
25.	CENTRAL GERMANY	619
	General, 619. Saxon Highland: Erzgebirge, 621. Vogtland, 623. Saxon Upland and the Erzgebirge Basin, 624. The Saxon Elbeland, 625. Dresden Basin, 625. Upper Lusatia (Oberlausitz), 626. Thuringia, 627. The Thuringia Forest (Thüringer Wald), 628. Thuringian Lowland, 630. The Harz, 635. The South Harz Foreland: Goldene Aue, 637. The Saxon Lowland or Bay, 637. Leipzig and Halle, 639. The Unity of Mitteldeutschland, 640.	
26.	BRANDENBURG AND BERLIN	645
	General, 645. The growth of Brandenburg, 645. The Terrains of the Middle Mark Lowland, 646. Zauche, 647. Teltowland, 647; Beeskow—Storkowerand, 649; Gubenerland, 650; Havelland, 650; Barnim and Lebus, 651. The Fläming, 652. Lower Lusatia, 654. Berlin, 656. Post-War Situation, 664.	
	SELECTED BIBLIOGRAPHY	666
	INDEX	687

MAPS

<i>Fig.</i>	<i>Page</i>
1. THE GERMAN LANDS (1 : 12 M.)	4
2. CENTRAL EUROPE (1 : 10 M.)	16
3. CENTRAL EUROPE: LIMITS OF THE ICE SHEET (1 : 12 M.)	21
4. GERMANY: LAND FORMS (1 : 4 M.)	24, 25
5. GENERALIZED GEOLOGICAL CROSS-SECTION ACROSS GERMANY	30, 31
6. GERMANY: BEGINNING OF APPLE-BLOSSOM TIME (1 : 12 M.)	55
7. GERMANY: BEGINNING OF WINTER RYE HARVEST (1 : 12 M.)	56
8. GERMANY: MEAN ANNUAL RAINFALL (1 : 10 M.)	57
9. GERMANY: SNOWFALL AND HUMIDITY (1 : 10 M.)	58
10. GERMANY: CLIMATIC REGIONS (1 : 6 M.)	62
11. GERMANY: SOILS (1 : 4 M.)	70, 71
12. GERMANY: NATURAL VEGETATION (1 : 4 M.)	78, 79
13. GERMANY: NATURAL REGIONS (1 : 4 M.)	82, 83
14. CENTRAL EUROPE: TRIBAL DUCHIES AND MARCHES, A.D. 950-1250 (1 : 10 M.)	89
15. CENTRAL EUROPE: BIRTH RATES IN 1930 (1 : 12 M.)	103
16. CENTRAL EUROPE: BIRTH RATES IN 1910 (1 : 12 M.)	103
17A. CENTRAL EUROPE: DENSITY OF RURAL POPULATION IN 1815 (1 : 12 M.)	107
17B. CENTRAL EUROPE: TOWNS IN 1815 (1 : 12 M.)	109
18. GERMANY: DENSITY OF POPULATION IN 1930 (EXCLUDING TOWNS) (1 : 4 M.)	112, 113
19. GERMANY: TOWNS WITH OVER 10,000 INHABITANTS IN 1930 (1 : 4 M.)	116, 117
20. CENTRAL EUROPE: GROWTH OF POPULATION, 1870-1930 (1 : 12 M.)	120
21. EXAMPLE OF A GEWANNFLUR IN THE RHINE MASSIF: NERDLEN	124
22. EXAMPLE OF A BLOCKFLUR IN SILESIA: LAHSE	127
23. EXAMPLE OF A DRUBBEL IN N.W. GERMANY: HALSTRUP	135
24. VILLAGE TYPES (From the <i>Messtischblatt</i>)	140
25. GERMANY: RURAL SETTLEMENT TYPES (1 : 6 M.)	145
26. FARMHOUSE TYPES	152
27. GERMANY: EARLY MEDIEVAL ROUTES AND TOWNS BEFORE A.D. 1200 (1 : 4 M.)	158, 159

<i>Figs.</i>		<i>Page</i>
28.	MEDIEVAL ROUTES AND TOWNS IN SOUTHERN GERMANY (1 : 3 M.)	175
29A.	THE PLAN OF THE MEDIEVAL GERMAN TOWN: I, RADIAL PLANS	181
29B.	THE PLAN OF THE MEDIEVAL GERMAN TOWN: II, AXIAL AND GRID PLANS	183
29C.	TOWN TYPES (ROTTWEIL, NEUBRANDENBURG, NEUSTRE- LITZ, HÖXTER)	185
30.	GERMANY: ECONOMIC REGIONS (1 : 6 M.)	199
31.	GERMANY: LAND USES (1 : 4 M.)	204, 205
32.	GERMANY: ASSESSED VALUE OF FARM LAND (PRE-WAR) (1 : 10 M.)	212
33.	GERMANY: SIZE OF FARM HOLDINGS (PRE-WAR) (1 : 10 M.)	213
34.	CENTRAL EUROPE: AGRICULTURAL REGIONS (1 : 10 M.)	216
35.	CENTRAL EUROPE: NATURAL RESOURCES (1 : 10 M.)	234
36.	GERMANY: EXTRACTIVE AND HEAVY INDUSTRIES (1 : 6 M.)	238
37.	GERMANY: MANUFACTURING INDUSTRIES (1 : 6 M.)	243
38.	GERMANY: RAILWAY GOODS TRAFFIC (1 : 10 M.)	255
39.	GERMANY: RAILWAY PASSENGER TRAFFIC (1 : 10 M.)	256
40.	GERMANY: NAVIGABLE WATERWAYS (1 : 8 M.)	259
41.	GERMANY: DISTRIBUTION OF BREAD GRAINS (1 : 10 M.)	267
42.	GERMANY: MEAT SUPPLIES OF THE CHIEF CITIES (1 : 10 M.)	269
43.	GERMANY: LIGNITE PRODUCTION AND MOVEMENTS (1 : 10 M.)	270
44.	GERMANY: IRON AND STEEL PRODUCTION AND MOVEMENTS (1 : 10 M.)	271
45.	GERMANY: TRADE IN MACHINERY (1 : 10 M.)	272
46.	GERMANY: TRADE OF THE RUHR IN MACHINERY WITH EAST GERMANY (1 : 12 M.)	273
47.	GERMANY: TRADE OF THE RUHR IN MACHINERY WITH SOUTH GERMANY (1 : 12 M.)	273
48.	GERMANY: HINTERLANDS OF THE CHIEF PORTS (1 : 10 M.)	275
49.	GERMANY: EXPORTS OF SELECTED CITIES TO TRADE DIS- TRICTS (1 : 10 M.)	279
50.	GERMANY: COMMERCIAL REGIONS AND CENTRES (1 : 6 M.)	281
51.	CENTRAL EUROPE: DISTRIBUTION OF GERMAN DIALECTS (1 : 10 M.)	313
52.	GERMANY: MEDIEVAL BISHOPRICS ABOUT A.D. 1000 (1 : 6 M.)	318
53.	CENTRAL EUROPE: THE BOUNDARIES OF THE REICH (1 : 12 M.)	321
54.	GERMANY: GAU, MARCH, AND DUKEDOM IN THE 10TH CENTURY (1 : 3.5 M.)	324, 325
55.	GERMANY: POLITICO-CULTURAL DIVISIONS IN 1790 (1 : 4 M.)	330, 1
56.	GERMANY: POLITICAL DIVISIONS, 1815-71 (1 : 6 M.)	335

<i>Figs.</i>		<i>Page</i>
57.	GERMANY: POLITICAL DIVISIONS OF POST-WAR GERMANY (1 : 6 M.)	368
58.	BASIC STATISTICS OF POTSDAM GERMANY BY ZONES (1936, 46)	376, 7
59.	PRE-WAR BASIC STATISTICS OF POTSDAM GERMANY BY ZONES	379
60.	WEST GERMANY: INCREASE OF POPULATION, 1939-46 (1 : 5 M.)	381
61.	WEST GERMANY: NATIVE AND REFUGEE POPULATIONS IN 1946 (1 : 5 M.)	383
62.	GERMANY: KEY TO MAP SHEETS OF TERRAIN TYPES (1 : 6 M.)	409
63.	TERRAIN AREAS OF THE MOERSEER LAND IN THE LOWER RHINE PLAIN	413
64.	TERRAIN AREAS OF THE BERGISCHES LAND IN THE RHINE MASSIF	415
65.	TERRAIN AREAS OF THE OLDENBURG-AMMERLAND IN THE NORTHWESTERN LOWLAND	417
66.	SETTLEMENT STRUCTURE OF THE NECKAR BASIN: I, SETTLE- MENTS (1 : 400,000)	420
67.	SETTLEMENT STRUCTURE OF THE NECKAR BASIN: II, FUNC- TIONS (1 : 400,000)	422
68.	TERRAINS AND REGIONS: SHEET 9, MIDDLE RHINELANDS (1 : 1·25 M.)	430, 431
69.	TERRITORIES IN THE LOWER RHINELANDS IN THE 13TH CENTURY (1 : 3·5 M.)	432
70.	THE SETTLEMENT OF THE RHINE PLATEAU (1 : 3 M.)	434
71.	SETTLEMENT OF THE RHINE PLATEAU IN THE 18TH CENTURY (1 : 4 M.)	436
72.	TERRAINS AND REGIONS: SHEET 5, NORTHWEST GERMANY (1 : 1·25 M.)	462, 463
73.	LAND NORTH RHINE—WESTPHALIA: AGRICULTURAL ZONES (1 : 2 M.)	465
74.	LAND FORMS OF THE LOWER RHINELANDS (1 : 600,000)	467
75.	THE GROWTH OF COLOGNE (1 : 100,000)	471
76.	THE RUHR: BUILT-UP AREAS (1 : 750,000)	479
77.	GEOLOGICAL SECTION OF THE RUHR COALFIELD	481
78.	LAND NORTH RHINE—WESTPHALIA: INDUSTRIES (1 : 2 M.)	483
79.	THE GROWTH OF ESSEN (1 : 100,000)	487
80.	TERRAINS AND REGIONS: SHEET 6, LOWER SAXONY (1 : 1·25 M.)	498
81.	TERRAINS AND REGIONS: SHEET 7, MIDDLE ELBE BASIN (1 : 1·25 M.)	499
82.	NORTHERN HARZ FORELAND	502

<i>Figs.</i>		<i>Page</i>
83.	BLOCK DIAGRAM OF THE ITH AND HILS IN THE EAST-PHALIAN UPLANDS	503
84.	TERRAINS AND REGIONS: SHEET 1, EAST FRIESLAND—OLDENBURG (1 : 1·25 M.)	518
85.	TERRAINS AND REGIONS: SHEET 2, SCHLESWIG-HOLSTEIN AND HAMBURG (1 : 1·25 M.)	519
86.	THE SITE OF HAMBURG (1 : 600,000)	520
87.	THE GROWTH OF HAMBURG (1 : 100,000)	525
88.	THE GROWTH OF BREMEN (1 : 60,000)	531
89.	TERRAINS AND REGIONS: SHEET 12, UPPER RHINELAND (ALSACE-BADEN) (1 : 1·25 M.)	540
90.	TERRAINS AND REGIONS: SHEET 10, RHINE-HESSE	548
91.	TERRAINS AND REGIONS: SHEET 11, NORTH BAVARIA	550
92.	THE GROWTH OF FRANKFURT-ON-MAIN (1 : 75,000)	553
93.	BLOCK DIAGRAM OF THE SOUTH GERMAN SCARPLANDS	565
94.	GEOLOGICAL SECTIONS OF THE SOUTHERN SCARPLANDS	567
95.	THE GROWTH OF STUTTGART (1 : 60,000)	569
96.	TERRAINS AND REGIONS: SHEET 13, WÜRTTEMBERG (1 : 1·25 M.)	570
97.	TERRAINS AND REGIONS: SHEET 14, SOUTHERN BAVARIA (1 : 1·25 M.)	572
98.	BLOCK DIAGRAM OF THE BAVARIAN PLATEAU	587
99.	THE GROWTH OF MUNICH (1 : 75,000)	594
100.	TERRAINS AND REGIONS: SHEET 3, MECKLENBURG	612
101.	TERRAINS AND REGIONS: SHEET 4, VORPOMMERN	613
102.	BLOCK DIAGRAM OF THE BALTIC UPLANDS	615
103.	GEOLOGICAL SECTION THROUGH THURINGIA	631
104.	TERRAINS AND REGIONS: SHEET 8, BRANDENBURG AND BERLIN (1 : 1·25 M.)	648
105.	THE GROWTH OF BERLIN (1 : 125,000)	656
106.	COMMUNICATIONS OF BERLIN (1 : 200,000)	657
107.	THE BUILD OF BERLIN (1 : 200,000)	658

TERRAIN TYPES (1 : 100,000)

Between pages 664 and 665.

108.	THE NORTHEASTERN LOWLAND: SHEET 245, BAD FREIENWALDE
109.	NORTHEAST MORAINIC COUNTRY : SHEET 247, SOLDIN
110.	NORTHWEST MARSHLAND (<i>Marschlandschaft</i>): SHEET 142, WILHELMSHAVEN

Figs.

- 111. NORTHWEST MOORLAND: BOG (*Moorlandschaft*): SHEET 173,
AURICH
- 112. NORTHWEST HEATHLAND: SANDY GEEST (*Geestlandschaft*):
SHEET 237, SOLTAN
- 113. SAXON BAY LOESS LAND: SHEET 364, HALLE
- 114. WESER-LEINE UPLANDS: RIDGE AND VALE COUNTRY OF THE
ITH AND HILS: SHEET 334, HÖXTER
- 115. RHINE PLATEAU AND GORGE: SHEET 505, BOPPARD
- 116. UPPER RHINE PLAIN: SHEET 558, MANNHEIM
- 117. HESSE UPLANDS: BASALT HILL COUNTRY: SHEET 383, AROL-
SEN
- 118. SOUTHERN SCARPLAND: SHEET 606, GÖPPINGEN
- 119. LOWER BAVARIAN HILLS COUNTRY: SHEET 611, LANDSHUT
- 120. UPPER BAVARIAN MORAINIC COUNTRY: SHEET 649, KAUF-
BEUREN
- 121. THURINGIAN LOWLAND: SHEET 386, BLEICHERODE

ILLUSTRATIONS

(Between pages 400 and 401)

1. *Rundling* VILLAGE IN BRANDENBURG
2. LINEAR VILLAGE (*Strassendorf*) IN SAXONY
3. MIDDLE GERMAN FARMSTEAD
4. SAXON UNIT FARMSTEAD: IN THE LÜNEBURG HEATH
5. HAMBORN IN THE RUHR
6. BROWN COAL QUARRY IN THE VILLE: WEST OF COLOGNE
7. ELECTRICITY PLANT: GOLPA-ZSCHORNEWITZ, NEAR MERSEBURG
8. ALLOTMENT AREA ON CITY OUTSKIRTS (*Laubengärten*): KÖTHEN
(ANHALT)
9. OCHSENFURT-AM-MAIN, SOUTH-WEST GERMANY
10. AMBERG, OBERPFALZ
11. DUISBURG-RUHRORT: EUROPE'S GREATEST RIVER PORT
12. LEIPZIG: OLD TOWN BOULEVARDS, AND RAILWAY COMPLEX
13. NORTH GERMAN LOWLAND: NEAR GIFHORN
14. BALTIC UPLAND: NEAR STOLPE ON THE BERLIN-STETTIN CANAL
15. TEUTOBURGER-WALD: VIEW FROM HALLE-IN-WESTFALEN
16. THE HILLY LANDS OF THE SOUTH PALATINATE (*Pfälzbergland*)
17. WESTPHALIA: DISPERSED FARMSTEADS
18. HOLSTEIN: HEDGED FIELDS AROUND THE *Geest* VILLAGE OF PINNE-
BERG
19. WESTPHALIA: HEATHER AND COTTON GRASS AND BOG
20. CULTIVATED PEAT BOG (*Fehnkolonie*) NEAR PAPENBURG
21. THE EIFEL: VOLCANIC HILLS AND A *Maar* LAKE NEAR DAUN
22. RHINE GORGE, NEAR EHRENFELS
23. HARZ: NORTH BORDER, VIEW TO SOUTH
24. RHÖN: FROM WASSERKUPPE (950 M.)
25. UPPER RHINE PLAIN: BERGSTRASSE, NEAR BERGSHEIM
26. SOUTH GERMAN SCARPLANDS: LIAS PLAIN AT FOOT OF ALB SCARP
27. BLACK FOREST: VIEW FROM FELDBERG INTO THE WIESENTHAL
28. LINEAR VILLAGE (*Waldhufendorf*), LANGENBIELAU, SILESIA
29. HEGAU: HOHENTWIEL (686 M.)
30. SWABIAN ALB: WEST OF GEISLINGEN, VIEW TO NORTH-WEST
31. RIVER MAIN: MEANDER, VIEW SOUTH FROM WERTHEIM
32. BAVARIAN PLATEAU: SOUTH OF MEMMINGEN

INTRODUCTORY

CHAPTER I

INTRODUCTORY

THE PROBLEM OF GERMANY IN ITS GEOGRAPHIC ASPECT

ONE OF the greatest problems of the German peoples has been described by an unbiased German writer¹ as the eternal search for their national being. "The German loves to probe and feel around intellectually in the stupendous thing that Germany is; and he specially loves to work with vague and indefinable terms, such as nationality, culture, race, Prussianism, soul, essence, Germanity, etc., and then to wield these with the utmost dogmatic violence, as though those who are unable to make much of such nebulosities were either unpatriotic or uneducated. People are never tired of asking whether a nation is a community held together by fate, or by necessity, or by a sense of values, or what not; they are never tired of enquiring as to the significance of language, race, nationality or state, *per se* and in relation to this or that within the nation or state.

A good deal of the national heart-searching is wasted in this endless game of question and answer, in order, it is supposed, finally to strengthen the foundations of German nationality for the maintenance of its national character. There is no other country in the world in which there are so many contradictory formulas. The nation is, according to taste, a mythos in which the individual is of no significance whatever, or an economic community held together purely by self-interest."

The problem of the unity of the German-speaking peoples, however, is not only an academic problem; for it has long been a first-class political problem to which the intellectuals have made outstanding contributions since the beginning of the great nationalistic movements of the early nineteenth century.

There have long been two schools of thought concerning the future of the German peoples in Europe. On the one hand, there are those, like Eugen Diesel, who regard Germany as a "land without design", without unity in its physical build and lacking clearly defined natural barriers as its frontiers, and without unity in its historical development or unity in its national aspirations. On the other hand, there are those who regard Germany as united by a single great design—of physical build, in spite of the absence of clearly defined natural barriers to frame

¹ Eugen Diesel, *Germany and the Germans*, 1929, translated by W. Robson-Scott, 1931.

it, of language, and of culture; and who maintain that these common ties, within a culture realm which is so markedly different from all others, far outweigh the contrasts in the national peculiarities of its component peoples.

Much was done after 1871 to effect the unity of the German peoples within the Second Reich and it is this one fact that has disturbed above all else the political equilibrium of Europe. The Nazi regime still further strengthened this unity within the bounds of the Third Reich. It also sought to extend the political hegemony of the Reich beyond its 1918 frontiers over all the German peoples who lay on its periphery together with those non-German peoples who for long had had close historic associations with the German group of states. These plans for expansion in the economic sphere were extended to southeastern Europe in particular. With different methods and a shift in objective this was essentially the same trend that led to the war of 1914. Since the defeat of Hitler's regime the Germans have been at the mercy of their conquerors. They have also been expelled from lands in the east that they have occupied for centuries and have moved west and piled up in the occupied zones of Potsdam Germany, where there was in 1946 a population of 65 millions as compared with 59 millions in 1939. We should always remember, however, that there are still as many German-speaking peoples as before the war, and even though it may be claimed that their aspirations and policies count for little in their defeat, they cannot be "suppressed" and, in some modified expression, they must be incorporated into the life of a new Germany in a new Europe. Moreover, the productive power of the pre-war Reich in terms of resources, if not of equipment, is essentially the same in its potentialities as in 1939 and in its indispensability to modern Europe. The problem of Germany and the Germans still remains, the more so through disruption, and this time it is for the victors to solve it.

Germany is shrunken, both ethnically and politically, and it is divided not only among the occupying Powers but also among a number of new constituent political units that these Powers have instituted. A federal Germany, economically productive and militarily weak, but with its members acting within the comity of European peoples, seems to be the main objective of the Western Powers. But the unification of the Western Zones with the Russian Zone seems to recede further each day, and the expulsion of the Germans from the eastern provinces of the Reich and their replacement by Poles is a *fait accompli* which probably not even another war would reverse. The attitudes of France, Britain, the United States and Russia to the German problem differ in various fundamental ways and it is only likely that these attitudes differ from those of the Germans themselves, in so far as they have yet crystallized.

It is essential, therefore, that we understand the permanent facts behind the problem in both its German and European aspects.

The German problem arises from three basic facts: first, the unity of the German peoples; second, the diversity of the German peoples; and, third, the peculiar geographic situation of their country, that is embedded in the heart of Europe (Fig. 1).

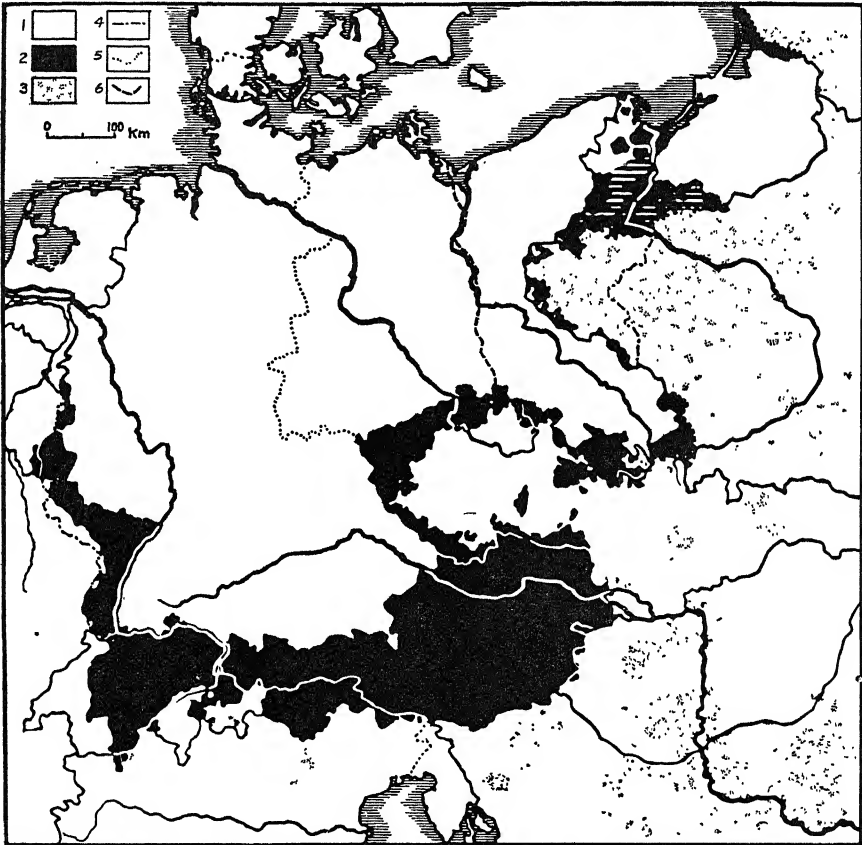


FIG. 1—THE GERMAN LANDS (*from Meynen*) (Scale, 1 : 12 m.)

- | | |
|---|--|
| 1. The German Reich, 1937 | 4. Frontiers of the Reich in 1914 |
| 2. Areas of German-speaking peoples outside the Reich frontiers | 5. Frontier between the West and East German Republics |
| 3. "Islands" of German speaking peoples | 6. Eastern frontier of Potsdam Germany |

The problem of the unity of the German-speaking peoples arises from the diversity of their cultural and political experiences. The German peoples form an ethnic group that is united by the ties of a common literary language, a common cultural heritage, and a large measure of

common history based on close political associations in peace and war through many centuries. The German tribal groups who settled in western Germany were organized under the First Reich with its beginnings in the coronation of Charles the Great in A.D. 800. In spite of its chaotic disintegration in the Middle Ages, the Reich continued as a medium of tenuous association and as a source of common disputes until its dissolution in 1806. During the nineteenth century consolidation was effected under the leadership of Prussia and this resulted in the emergence of the Second Reich in 1871. The peoples of western Europe were welded into unified nation-states in the Middle Ages, but Germany was divided into nearly four hundred independent authorities until 1815. Their number was then reduced to a tenth, but even these retained their sovereign independence under the tutelage of Prussia until they were reduced to the status of administrative provinces by Hitler.

The unity of the Reich was strengthened by the remarkable social and economic changes in the generation from 1870 to 1914, during which period Germany became the strongest single state in Europe with ever closer economic ties with her neighbours, ties that became as essential to these neighbours as to Germany herself. Political expansion was largely dictated by economic necessity as well as by the desire to achieve the unity of the German peoples and restore the hegemony of Germany over the historical provinces on its borders that had fallen from the German realm.

The German peoples and the German State thus form a loosely knit and elusive realm that was consolidated under Prussia, and has been more closely welded by the unification of the Reich since 1871 and, in further measure, under the Nazis. To this vaguely defined realm the name of *Deutschland*, German land, has been given for several centuries, although it was never used as an official political title until the nineteenth century. Cultural, economic and political associations have fluctuated from time to time. The State of 1918 had Germans immediately beyond its borders in other states, to the east, south and west, in Poland, Czechoslovakia, Austria, Switzerland, France and Luxembourg. The realm, however defined, lies in the heart of Europe, surrounded by non-Germanic peoples—Dutch and French to the west, Slavs and Magyars to the east, Italians to the south, Poles and Czechs to the east, Danes to the north. From these peoples and states it is not separated by clearly defined natural barriers, but by wide zones of contact.

Within this major German realm, however, there is a great diversity of peoples that has persisted at a political level until our own day. As elsewhere in western Europe, the initial tribal groupings formed the framework in which there developed, in the Middle Ages, distinctive cultures, whose manifestation in dialect, customs, temperament, farm, and town,

are living items of the cultural heritage. These were never destroyed by the chaos of political divisions that split up the lands and peoples for six hundred years.

This diversity is based, however, not merely on the distinctive culture heritage of the main tribal groups. It derives also from the diversity of the lands; from the lack of a natural focus comparable with that of Paris and London in the historic period; and, in consequence, from the diversity of culture contacts that were able to penetrate the German realm. These external culture contacts were also associated with the outside political associations of the German realm, and with the diversity of its dynastic associations. The Habsburgs had their place of origin in southwest Germany; the Hohenzollerns had their seat in the Main Valley but they early became the rulers of Brandenburg and the founders of Prussia; the Hanoverian rulers were closely allied with England in the eighteenth century.

The German Emperors also found themselves deeply involved, in the Middle Ages, in the affairs of northern Italy, whence they derived their title and powers. The Italian wars and the long disputes with the Papacy dissipated the time and energies of the Emperors, and distracted their attention from the consolidation of their territories north of the Alps. Gustavus Adolphus of Sweden in the seventeenth century was able to control the mouths of the Oder, the Elbe and the Weser. French cultural influences were strong during the eighteenth century, especially in the Rhineland. The country was overrun and subdivided by the armies of Napoleon and Russia. It is now overrun and controlled by four foreign Powers, and the Germans in each occupied zone are being thoroughly indoctrinated in a variety of ways in the way of life of the occupying Power. Deep and fundamental are the different forms of "culturation" in the French, British, American and Soviet Zones.

There was also a broad cultural division within the German lands. The main seats of medieval civilization lay in the Rhinelands, which from the outset were deeply penetrated by contacts with Roman civilization. The Saxons were esconced in the lands to the northeast between the Harz mountains and the Elbe, where they developed a culture and a political dynasty far removed from Roman contacts, and in this same general area the Hohenzollerns built up Prussia from their nucleus in Brandenburg. It was not until the nineteenth century that Berlin became the dominant political focus of the new Germany, displacing the old-established cultural centres in the Rhinelands.

The third basic fact of the German problem is that the country lies in the heart of Europe and is bordered by nine states from which it is not separated by natural barriers and across whose frontiers are to be found peoples of German speech. The strategic significance of this fact

obviously depends on the unity, strength and the policy of the German State.

During the last hundred years the loosely knit group of German peoples and states, to which the term Deutschland has been given through many centuries, has become a closely knit state. This state during the short span of forty years became the greatest economic power in Europe. In place of the historic Germany of poet and philosopher there rapidly emerged the modern Germany built upon coal and iron, a rival to the nineteenth-century supremacy of Britain. As a great manufacturing nation with a rapidly growing urban population Germany became increasingly dependent on imports of raw materials and food-stuffs, and made increasing demands on foreign markets as outlets for its manufactured goods. The neighbouring countries also became increasingly dependent on Germany. Such ties demanded freedom of movement of goods and peace among the members of the German fraternity of states. But there was also the military aspect of the situation. Germany became economically and militarily strong under Bismarck. Economic growth demanded expansion of markets, not merely in Europe, and particularly in the lands to the east, but also in the backward tropical lands overseas. This need and ambition brought strategic demands and military and naval expansion. Three times in one lifetime Germany has made war—1870, 1914 and 1939. The first time she humiliated France and acquired Alsace and part of Lorraine. The second time she met with ultimate defeat. The third time has spelled defeat, occupation and chaos. The tables have been turned since the mid-nineteenth century. Germany's central position in the heart of Europe became not merely a source of military weakness to herself, but also a threat to her lesser neighbours. And yet the paradox of the situation is that in order to maintain their pre-war standards of living, let alone to raise those standards to the minimum level of contemporary dietetic demands, all the smaller countries of Europe are dependent on a productive and prosperous Germany.

The geographic situation of Germany in the heart of continental Europe involves the state in intimate relationships with the lands and peoples to the west and to the east. Moreover, especially since the development of its modern economic structure and its increasing interest in overseas markets, it has sought sea-outlets. The North Sea frontage afforded possibilities for the emergence of great ports, that have been exploited by both the free cities of Bremen and Hamburg as well as by the State of Prussia. From a military point of view, the German navy had its principal field of operations in the North Sea. The British navy was able to bar, more or less effectively, the outlets through the English Channel and the outlets northwards from the islands that lie between

Scotland and southwest Norway. To the Germans the North Sea is the *Deutsches Meer* and the entrance to the combined estuaries of the Elbe and the Weser is the *Deutsche Bucht*.

Germany lies astride western and eastern Europe and the *Drang nach Osten* has been a dominant theme in German history. Sir Halford Mackinder divided Europe into the western coastlands, that can be controlled by sea-power, and the continental interior, that can be controlled by land-power. He drew the divide between the two from the Dardanelles across the Balkans to the head of the Adriatic, thence north through Austria, Bohemia, east Germany and Jutland, across the Kattegat, and thence north between Norway and Sweden. At the Dardanelles and the Sound eastern land-power can bar access to western sea-power. A great transitional zone lies between these coastlands and the upper Volga basin, the historic core of land-locked Russia. This zone, with its diversity of peoples, has been subjected through history, in peace and war, to both western and eastern (Russian) influences. It emerged as a belt of new nation-states in 1919. The last phase of German dominance in this zone has now been superseded by Russian dominance. The divide noted above is now the Iron Curtain between the Western Powers and the Soviet and its central European satellites. It divides Germany proper into a west and an east, along an age-old historic divide, between which there are deep-seated contrasts in people, history, and economy.

This is a broad view of the problem of Germany. We may now briefly examine how geography can contribute to its elucidation. Geography is concerned with the regional differentiations of the earth's surface. It studies regional groupings of society in their relations to the lands they occupy. Thus, we may turn at once to several concepts relevant to our theme.

The natural terrain is the basis of human occupation. Its traits may be abstracted from the geographic landscape, but do not occur in their primitive condition except in areas untouched by man. Such areas are few in Europe, and it is difficult indeed to determine their characteristics (especially in terms of vegetation cover) exactly, so that the depiction of the existing natural conditions amounts to abstracting these traits as at present from the present landscape. Detailed analysis of any small area in England and Germany in the course of a day's march reveals that there is the closest local adjustment of human occupation to the natural conditions. The pattern of human occupation is most complicated in urban areas and their areal differentiations are primarily based on function not on natural terrain. The natural conditions, in other words, are usually the most important correlatives of local associations of human occupation. This concept is not in any sense deter-

ministic. Minute unit areas with similar natural conditions may have similar or quite dissimilar modes of human occupance. But if the fabric of human occupance coincides with a set of terrain conditions then clearly we have a certain measure of harmony between the two, the chief local correlatives of which are the latter. On the other hand, there are many areas with similar terrain conditions which exhibit a lack of coincidence of the human with the natural fabric, and this disharmony is clearly due to the operation of overriding human forces.¹ Any geographical study therefore must begin with the accurate appraisal of the natural terrain and its areal variations before proceeding to the study of human occupance.

The natural or physical unit so defined serves as a framework, in either detailed topographic facets or in major areas, for the study of the mode of adjustment of the activities and organization of Man on the Earth. It is the "site" on which human groups, ever changing in their activities, organization and equipment, adapt themselves in varying ways to both the physical conditions and to the man-made environment that is bequeathed to them by their predecessors and is in constant process of change. In establishing working relations to the land man modifies the natural terrain to meet his needs. The transformed environment is made up of a mosaic of *form units*. These are unit areas of the geographic landscape, considered as to its separate elements—relief, vegetation, land use, settlement—and in various combinations. Human groups, economic, social and political, are arranged into *functional units* or entities that either correspond in their smallest detail to a single form unit or to an association of sections of several form units. Human society is organized into areal groups at all levels from such units or cells as the farm, dwelling and factory, upwards to groups of a social, economic, political and cultural character. It is only in terms of these human functional groupings that the character and areal interrelations of the elements of the landscape become understandable.

The summation of man's varied relationships with the land is reflected in his distribution on the land. This refers to the people themselves, the buildings in which they live and work, the fields which they till, the quarries in which they exploit the resources of the earth's crust, and the routes on which they move. The density and the modes of grouping of human societies on the earth's surface is another way of expressing the density and distribution of their settlements. It is necessary to sepa-

¹ There is a subtle distinction here in the German geographical terminology between *Naturlandschaft*, which refers to the land before touched by man, and the *Naturraum*, which refers to an area (not a landscape) defined, as an abstraction, through the coincidence of certain existing physical or natural conditions. Similarly a *Kulturlandschaft* refers to the totality of a visible geographic landscape which is everywhere deeply transformed by human occupance: whereas a *Kulturraum* simply refers to an area in which certain selected human phenomena have a coincident distribution.

rate the urban populations, who live in compact settlements, arranged at small spots of the whole of the earth's surface, from the rural populations, who live and work on the major portion of the land surface. Difficulties arise here in concept and presentation, since there are industries in rural areas and urban workers who live in the country.

This whole problem of mapping and interpreting the distribution and density of population and settlements is a basic theme of all geographical work and requires much detailed thorough analysis of small areas as well as the presentation of major characteristics and issues. It would demand mapping Germany on a scale of at least 1:200,000. The interpretation of such patterns rests on such major considerations as the amount of land under cultivation, and the character and intensity of cultivation of the soil, i.e., the modes of agricultural occupance of the land. Laws of inheritance, migratory movements of all kinds, the balance of birth and death rates, in their detailed and general areal variations, are other factors in this equation. Then, again, one must consider the proportion and geographical distribution of the people who are engaged in industry, commerce and administration. These are mainly concentrated in towns (and it is for the geographer to determine at the outset just in what combinations and degrees), but they are also distributed over the countryside in varying ways from one area to another, and these facts depend as much on historical development as upon present function. All these are facets of the general picture of the distribution of man and his settlements on the face of the earth and require thorough appraisal in any geographical study. These paragraphs we feel are essential as an introduction to this book, since they indicate the conceptual framework upon which it is based.

In turning to the study of Germany, the geographer, since he studies the ways in which man occupies the land, at once asks some basic questions. What is the nature of the various aspects of the unity of the German people and in what respects, therefore, do they form a geographic entity in Europe? What areas do they cover? What relation do these areas bear to each other and to the detailed articulations of the natural elements of the earth's surface, as well as to man's imprints on that surface? Clearly, such questions cannot apply only to the geographical fabric of the German realm (however defined) as a whole. They demand analysis of the parts of which the whole is composed in its varied aspects, of the variations and interrelationships of human groups on the land, and of their relations to the detailed features of the environment and the habitat. What, then, is the detailed fabric of natural units? What are the detailed associations of social, economic and political units? What effect do these associations have upon the mode of distribution of the people and of their settlement on the detailed fabric of

natural units? Into what more general, larger entities may Germany be divided on the basis of each of these sets of man-land relationships? Such questions are the essence of the geographic approach in the study of any part of the earth's surface. It is an approach, therefore, that should throw light on the nature of the problem of the diversity and the unity of the German peoples and of the German lands.

In conclusion, it must be emphasized that there is a fundamental contrast between the so-called "historic Germany" of the poet, the musician and the philosopher, the craftsman, the peasant, and the serf; and the modern Germany of large-scale industry and specialized agriculture, directed in large measure to the feeding of specialized producers, who are crowded in industrial occupations in urban agglomerations, or who combine the cultivation of the land with an industrial occupation either in their home or in the factory. Germany just before the advent of the railway and the unification of the Reich in the mid-nineteenth century was little different from the medieval Germany that in turn grew out of the settlement of the Germanic tribes. Revolutionary changes were quickly effected, however, in a generation. The character of human groupings and their relation to the land can only be appreciated, therefore, in terms of the sequence of human occupancy in these lands and in terms of the mode of man's adjustment to the physical environment, and his transformation of it according to his social, cultural, and economic development.

At the outset, we must make it clear with just which Germany we are concerned, for there is the "historical" Germany, there is the "ethnic" Germany—the area occupied by all the German peoples—and there is the "political" Germany. In the political sense there is the Germany of 1914, of 1938, and there is the post-war Germany. This last may be taken as the Potsdam Germany with its pre-war boundaries to the north, west and south almost intact, but reaching eastward only as far as the rivers Oder and Neisse. This is the Germany that is occupied by the four Powers, Britain, France, the United States and Russia, from which, since the four Powers have so far failed to agree on the method and substance of a unified Germany, there have emerged two new federal states in the four zones of occupation, one in the west and the other in the Russian Zone in the east. (Fig. 1, p. 4.)

In our treatment, we have two objectives that run right through the work. The first is to examine the pre-war Germany as a whole and in its varied relations with the surrounding lands and peoples of central and western Europe. The second is a more detailed appraisal of the geography of the lands of Germany. For this latter purpose we have given main attention to the post-war or Potsdam Germany east to the Oder-Neisse frontier.

In its arrangement, the book falls into six parts.

Part I deals with the German lands. It examines the main components of the physical environment—namely, the land forms, climate, vegetation and soils—and concludes with a summary of the natural physical units that make up the west German lands.

Part II deals with the German peoples—their growth and spread in central Europe, and the distribution of the population.

Part III deals with the habitat of the German peoples—field, farm, village, and town.

Part IV deals with the modern economies in their areal variations—agriculture, industry and commerce, as they have developed during the last century out of the background of the “historical Germany”. A concluding chapter deals with the foreign trade of Germany, with particular emphasis on its trade with the surrounding European states.

Part V deals with the modern political geography of Germany. It contains discussions of the ethnic traits of the German peoples; their politico-geographical groupings; and of regionalism in Germany. This section concludes with a chapter on geographical aspects of post-war trends in Germany.

Part VI contains twelve chapters on the regional geography of Germany, in which the various aspects discussed in the first four parts are synthesized in each major regional division. Attention is here focused on the description and interpretation of the town and countryside. Its basis is a series of maps prepared on a scale of 1 : 200,000. This part covers almost one-half of the length of the book.

PART I

THE LANDS .

*Für die Geographie wird immer das wichtigste bleiben, die Erdoberfläche zu erforschen, zu beschreiben und zu zeichnen.*¹—Friedrich Ratzel, 1882.

¹ The main purpose of Geography will always be to investigate, describe, and map, the surface of the earth.

PART I

THE LANDS

IN THESE first chapters we shall portray the lands of Germany in general and of western Germany in particular. Surface relief, climates, soils and vegetation are the "natural elements" of the human environment. They are causally interrelated and the minutest areas in which they coincide are therefore natural terrain or "site" units. But such units are abstractions, since the greater part of the face of Europe has been modified by man through his labour and by the addition of his works at different epochs in his history. Such natural conditions may be projected back to the time before man had appreciably affected the surface of the lands as provide by Nature. This is referred to by geographers as the "natural landscape". It is, however, always a problem to decide just how and when man began to change the natural conditions. This applies above all to the vegetation, which has been profoundly changed by man from Neolithic times onwards. If one is to use the term "natural landscape" at all in Europe it must apply to a specific time and the time that has been selected by German scholars for this purpose is the period immediately preceding the great phase of forest clearance, the *Rodungszeit*, that began with the settlement of the German tribes in the middle of the first millennium of this era and continued into the late Middle Ages. It is in this sense that we use the term "natural landscape" in this book.

The natural landscape of western Europe has been transformed throughout the period of human occupancy through the changes of man's economic, social and political activities and organization. This transformed landscape, that is the embodiment of a long period of historical development, is called by English-speaking geographers the "cultural landscape". It would be better described as the geographic landscape, since it combines both the natural elements of the terrain and the cultural elements added by man through the modifications of natural features and through the addition of man's works.

Now, it is of particular interest that in Europe there is a remarkable adjustment of the detailed patterns of the cultural elements to the natural elements of the geographic landscape. In other words, if a systematic attempt be made to analyse the detailed patterns of the geographic landscape it will be found that the predominant elements in the com-

posite character of the landscape are the natural or physical elements. The minute variations of the mosaic of cultivated land, settlements and routes, fit closely into the minutiae of the natural framework of the terrain, in spite of the numerous man-made patterns of the landscape that cut right across various terrains. This, we repeat, is not a deterministic approach. It is simply a statement of fact that can be demonstrated by a comparison of the distribution of the natural elements with the human, either in an area such as western Germany as a whole, or in a minute section of that same area within a few square miles. The intimacy of this adjustment of human activities to the physical environment in western Europe is a fact that demands closer attention on the part of governments and individuals in the lands of relatively recent settlement in the New World, where the idea has held sway for some time that the technical abilities of man permit the exploitation of the land irrespective of the demands of Nature. No matter how elaborate or simple its structure, human society is always tied to the terrain or site, and all societies, in a myriad ways, must establish working relationships to the lands which they occupy.

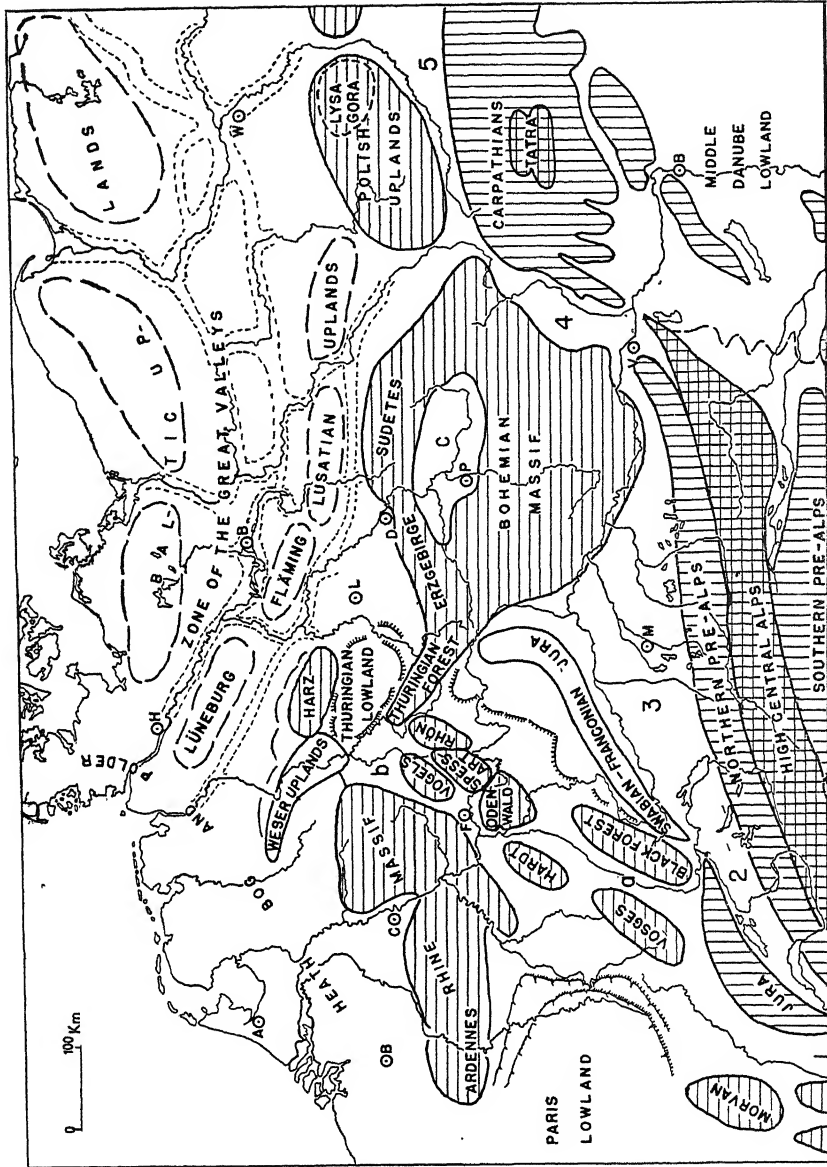


FIG. 2—CENTRAL EUROPE: RELIEF (scale, 1 : 10 m.).

Alps and Carpathians. Cross hatching shows areas above 6,500 ft. and vertical lines areas below 6,500 ft.

The Alpine Foreland Sections are numbered as follows:

1. Saone Lowland (between Morvan and Jura)
2. Swiss Plateau
3. Bavarian Plateau
4. Moravian Lowland
5. Galician Plateau

Central Uplands (*Mittelgebirge*).

Horizontal lines show the plateau blocks. Barbed lines show scarped ridges or plateaus, the line being the scarp face. Enclosed lowlands are indicated as follows:

(continued at foot of next page)

CHAPTER 2

RELIEF

THE DEVELOPMENT OF THE LAND FORMS

LAND FORMS in general and in their smallest facets can only be understood in terms of the character and disposition of the rocks and of the processes by which land forms are moulded. We must understand the natural elements of the land in order to evaluate their significance in terms of human occupancy. This, however, demands a thorough knowledge of the geology and of the geomorphological processes in order to evaluate and understand the detail of the terrain—slopes, rocks, water supply, soils and natural resources. The geographer must understand the large-scale geological map and the geological sequence and he must be able to apply the detailed map of outcrops to the interpretation of the terrain. Thus, even in this work, the student, though not a geomorphologist engaged primarily in the study of processes, must be familiar with the geological history of his area of study in its bearing on the present landscape and in its bearing on the changing character of the sequent occupancy by man. It is an essential part of his equipment. Plunged into a regional study of a major land area or, still more exacting, into a study of a small area, without this equipment, he would be completely unable to evaluate the area as a habitat for man. The empirical approach is essential but inadequate as a means of evaluating the terrain and the interrelationships of the natural features associated with it. The following presentation is essential therefore to the understanding of the surface features of the German lands and the changing character and patterns of man's activities in these lands. The detailed geological time scale is given on p. 50. General relief features are shown on Fig. 2.

There have been several periods of mountain building in Europe, and two of these affect the present physiography of Germany. Towards the end of the Carboniferous period the sedimentary rocks, such as grits, limestones and shallow water coal-measure deposits, were intensely folded within the earth's crust and then uplifted to form great mountain ranges.

a. Upper Rhine Plain

b. Hessian Lowland

-. Thuringian Lowland (named)

c. Upper Elbe Lowland (Bohemia)

Northern Lowland. Heavy dashed lines enclose uplands. Light dashed lines enclose the great glacial troughs.

Circles with letters refer to the chief cities.

Note. The Swabian-Franconian Jura is scarped on the north side.

These stretched right across central Europe from western Ireland and Spain. Granites were involved in this folding and other rocks were transformed by great heat and pressure to form schists, slates and gneisses. The granites in particular formed the uplands of highest altitude, while in downfolds or synclines on the northern borders of the mountains, coal measures have been preserved from erosion, as in the basins of Britain, northern France and Belgium, southern Limburg, the Ruhr, several small fields on the northern edge of the German section of the Central Uplands, Upper Silesia and south Russia. Small fields also occur in scattered downfolds, where the coal has been preserved from erosion, as in the Saar and a number of very small fields around the Central Massif of France. These foldings are referred to by geologists as Hercynian, a name derived from the old German name for the forested lands of central Germany.

The Central Uplands are the roots of these mountains that were subjected to erosion by water, air and ice throughout the Permian and Triassic periods of the Mesozoic Era. The mountains were eroded to fairly level surfaces called *peneplains*. The seas transgressed over sections of these lowlands and, particularly in the Triassic period, there were laid down three massive series of deposits of sandstones, limestones and marls, in that chronological order. Hence the name Triassic as used by geologists to designate the three main groups of differentiated strata. These groups are referred to generally as Bunter sandstones, Muschelkalk (coarse limestones), and Keuper marls. Even more extensive marine transgressions took place during the Cretaceous period, the very name of which indicates the predominance of chalks that were laid down in deep sea waters. But there are also shallow water deposits in this series, especially in the Lower Cretaceous period. These include alternating layers of soft sandstones and clays. During the Upper Cretaceous period there occurred the greatest marine transgressions of all time, when almost the whole of the existing lands were submerged.

The great Hercynian land mass, with its isolated islands and extensive shallow seas, was bordered to the south by a great ocean trough or "geosyncline" on the site of the present Mediterranean Sea and the lands that border it. Deposits of great depth were laid down in this trough, and these were then crushed by the second great mountain-building forces. These began in the middle Tertiary period and continued throughout Oligocene and Miocene times. Thus the rocks in this great geosynclinal were folded and crumpled and outthrust northwards, jammed, as it were, in a vice between the relatively resistant blocks of the Hercynian massifs and the great resistant block that made up most of Africa. The Hercynian blocks, subjected to great pressure by this folding from the south, behaved like resistant paving-stones. Some were heaved up as

blocks, and fractured along lines called faults, so as to form uplands, like tilted paving-stones, and sunken troughs, called respectively in German *Horst* and *Graben* (English, *Rift*).

Vulcanicity accompanied these earth movements. Massive volcanoes rose from the plateaus whose surfaces were often blanketed by extensive lava flows, as in the Central Massif of France, and in the Rhön and Vogelsberg in central Germany. The uplands we see in these areas today are for the most part the eroded ruins of these volcanic outpourings. Crater lakes, craters and residual volcanic plugs, stand out from the lowlands of softer, eroded rocks, and level lava floors occur in many parts of the Central Uplands.

Finally, the horizontal sediments that lay on the old peneplain were gently folded or rippled, like those that make up the whole of south-eastern England. Similar "structural lowlands", formed by the subsequent differential erosion of these strata, are to be found in the Central Uplands, enclosed by the higher uplifted blocks that are remnants of the Hercynian mountains.

Especially distinctive in Germany is the so-called Saxonian Folding (*Saxonische Faltung*) that affected the Mesozoic and, more especially, the Cretaceous strata on the northern border of the Hercynian land mass. This folding commenced in the Upper Jurassic and continued right to the Miocene. It resulted in the steep autochthonous folding of anticlines and synclines, which, through subsequent differential erosion, yield either the kind of relief associated with the Weald or an "inverted relief" in which the hard rocks of the synclines stand out as ridges with outward-facing scarps. This structure is particularly characteristic of the northwest Weser Uplands and the northern foreland of the Harz. These folds, trending northwest and southeast, have the same direction as the faulted highlands of Thuringia, and both originated in mid-Tertiary times.

After the Tertiary earth movements, marine transgressions were negligible. Throughout central Europe this Pliocene period was predominantly a period of erosion and secular uplift. Many of the features of the Alps—the concordant summit levels of its peaks and passes—and many peculiarities of its river valleys, reflect periods of great uplift, oscillating with periods of subsidence. Through such uplift the rivers were "rejuvenated" and acquired renewed cutting power. The gently folded rocks of the lowlands were eroded so that the harder limestones and sandstones formed scarps with more gentle "dip" slopes, and the softer rocks of marls and clays, intercalated with each other, were eroded to form lowland vales. Rivers and atmospheric erosion stripped the highlands bare of their sedimentary covers and thus there were revealed the rounded outlines of the granites and Paleozoic rocks of the "fossilized"

(that is, the hidden and preserved) pre-Cretaceous peneplains. The rivers carried down their loads to the lowlands where detrital deposits accumulated.

After the uplift of the Alps, a great trough or geosyncline extended along their northern side, occupying approximately the site of the present Swiss and Bavarian Plateaus. In this trough there were laid down great masses of gravels and coarse sands by the Alpine rivers, and these now form sandstones and conglomerates (*Molasse*) that form the basis of these areas, although their smooth relief is often concealed by masses of morainic material that have been deposited by glaciers from the same source. Some of these mid-Tertiary sediments were involved in the latest Alpine foldings, and crumpled and uplifted to form mountain masses such as that of the Rigi near Lucerne in Switzerland.

The Rift Valley in southwest Germany, that lies between the two horst blocks of the Black Forest and the Vosges, was filled with thousands of feet of alluvial detritus in a basin that was evidently continuously sinking. The rivers Rhine and Meuse on issuing from the northern edge of the Central Uplands built up enormous deltas of gravels, that have been cut up subsequently by the later river courses as the old deltas were slightly uplifted. Such delta gravels form much of the surface of northwestern Germany, Holland and Belgium. Erosion and deposition in a long period of alternating uplift and subsidence, with the former generally by far the more important, characterize the Pliocene and Pleistocene periods, when the major physiographic features of our lands took their present form.

Yet another great event, however, was to affect these lands and determine their surface features over extensive areas (Fig. 3). This was the great Ice Age of the Pleistocene period. A great Ice Sheet, comparable to that now covering Greenland, covered Scandinavia and spread southwards across the site of the North and Baltic Seas to the lands beyond them. At its greatest extent it covered all north and central Russia south to a line from Kazan to Kiev, almost reached the foot of the Central Uplands, stretched westwards to the lower Rhine (across central Holland), and covered the British Isles south to a line from London to Bristol. At the same time, glaciers filled the valleys of the high mountains to the south, in the Alps and the highest sections of the Central Uplands.

It is from the study of the Alpine valleys and their deposits that the detailed history of the Ice Age has been unravelled.¹ There occurred

¹ The great pioneer work here was that of A. Penck and E. Brückner, *Die Alpen im Eiszeitalter*, 3 volumes, 1901-9. They recognized four periods of maximum ice extensions in the Alpine area which they described as the Günz, Mindel, Reiss and Würm phases, each of these being separated by a relatively mild interglacial period during which the fronts of the valley glaciers retreated. They also established minor cold phases as fluctuations at the close of the Ice Age.

three periods of greater severity of climate. Between these phases there were two periods of less active glaciation, when the ice front and the snouts of the valley glaciers retreated. At the halting phases, great masses of morainic rubble were laid down. As the ice retreated, the underlying

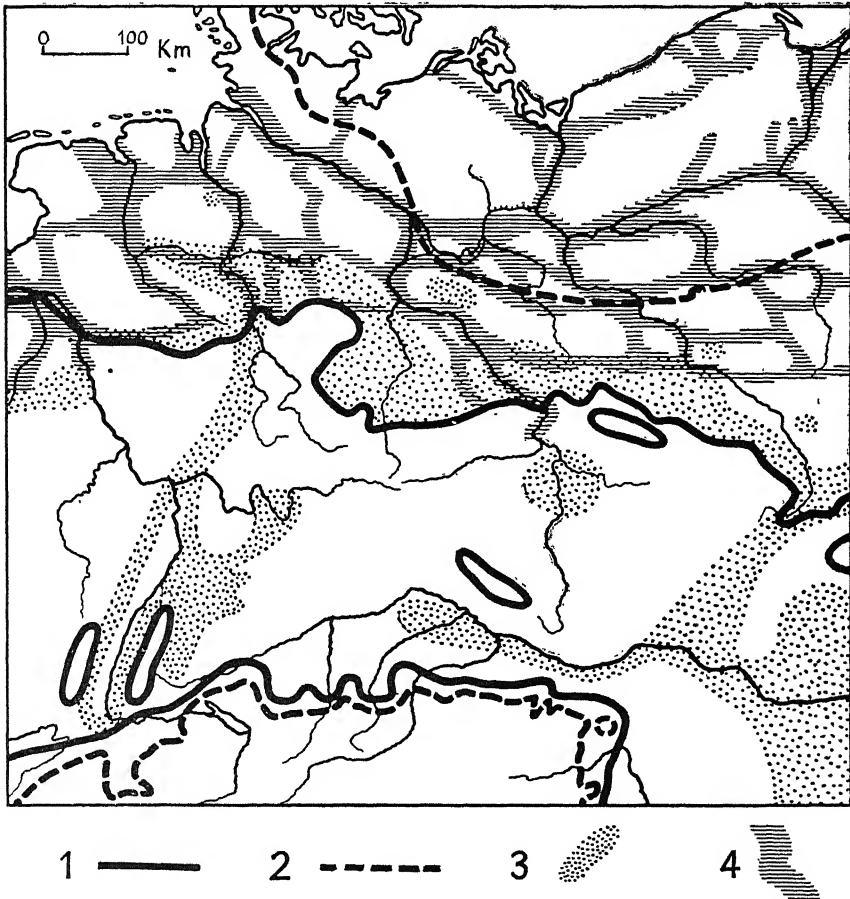


FIG. 3—CENTRAL EUROPE: LIMITS OF THE ICE SHEET (scale, 1 : 12 m.)

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|---------------------------------|--|
| 1. Elster and Riss-Saale Phases | 3. Loess |
| 2. Vistula-Wurm Phase | 4. The glacial troughs (<i>Urstromtäler</i>) |

beds of morainic rubble and loams (boulder clays) were left *in situ*. The melt-waters were carried westwards in what now appear as great valley troughs (*Urstromtäler*). Thus, ill-assorted and unconsolidated deposits of clay, gravel and sand, partly glacial and partly laid down by rivers underneath the ice and beyond its terminal moraines, characterize the areas that were formerly covered by the great Ice Sheet. In the Alps, in

particular, the valley glaciers spread out to the plains beyond, and the Bavarian Plateau is built up for the most part of such glacial moraines and fluvio-glacial sands and gravels.

Fine particles were blown by the wind from these newly exposed surfaces and deposited to the south, along the margins of the Ice Sheet. Such deposits were often redistributed by water so that the details of their character and distribution are extremely complicated. This wind-blown deposit is known as loess and is best preserved with considerable depth in areas of flattish relief. It occurs in great tracts on the northern border of the Central Uplands between them and the edge of the Ice Sheet from Picardy to the "black earths" of the middle Elbe basin, the Ukraine and southern Russia. It is also found in considerable areas of smooth relief in lowlands in south Germany, and frequently occurs as strips in the valleys on high flat terraces, where it has been left by the erosion of the rivers subsequent to its deposition.

The Recent Period is marked by the formation of dunes, the filling of the lakes, the formation of bog (*moor*), the formation of marsh and dunes, and of spits and embayments on the northern coasts. The deposits of the glacial period are known to German geologists as *diluvial* as distinct from the *alluvial* deposits of the Recent Period.

From this summary the student will appreciate the main features of the development and character of the land forms of the German lands, and, moreover, the main features of the stratigraphy of each geological period in so far as it affects the land forms. We may now turn to consider in more detail the physiography of the lands of western Germany.

Fig. 4 shows the land forms of western Germany as mapped by Otto Maull, with minor amendments. This map is based upon the joint consideration of the relief and the geology. The latter may be checked against the Lepsius geological map of Germany on a scale of 1:500,000. This map is important as showing the final generalized presentation of the land forms of Germany by one of the leading contemporary German geographers. The student must refer to it again and again as a basis of reference in all the subsequent treatment. Suffice it to note the main features here.

Marshes (1) are shown on the North Sea coast, along the lower courses of the main valleys, and (beyond the present map) in the low-lying areas of Holland, that are now largely drained and poldered. The dunes (2) include both the coastal dunes and the areas of dead dunes along the floors of the great valleys of the Northern Lowland. Then follows in the key the group of physiographic elements that make up the glaciated Northern Lowland and the Bavarian Plateau. These elements are the great glacial troughs, the morainic plains and uplands, and terminal moraines, the sandy outwash areas in front of the terminal moraines (*Sandr*) (4-7). The extreme limits of the earliest and latest glacial phases, and the northern limit of the loess deposits in the Northern Lowland are also shown (8-10). The loess deposits, that have a distinct type of relief, are not shown

separately though they are all plains areas. For these reference must be made to the soil map. Then follow the highland areas (*Grundgebirge*) with residual outstanding ridges and highlands and small lowlands of erosion within them (11-13). The plateaus developed on the horizontal Bunter and Keuper sandstones and the eroded lowlands which they contain are demarcated (14-17). The plateaus developed on the horizontal limestones are shown, as well as the lowlands that are developed on soft Keuper and Lias marls, as in Lorraine and inner Thuringia. Other lowlands (18), more complicated in structure, described as 'neutral' and developed mainly on soft Mesozoic strata, include the Herford basin, the Harz Foreland and the Saar depression. Volcanic uplands are also distinguished (19), the chief being the Rhön and Vogelsberg, the Westerwald and the eastern Eifel. Alluvial plains (20) include the Rhine Rift, the Danube, and the Neuwied and Landestuhl depressions. The Alpine valleys are included in this category. Fault scarps, erosion scarps and transverse gorges, all particularly important in the Central Uplands, are shown by appropriate shading (21-23). In the last group of symbols are included the physiographic elements of the Alps and the Jura, that take up a small area within the political boundaries of Germany proper (24-32). Here are shown the autochthonous limestone folds of the Jura; the high Alps (over about 2,000 m. or 6,500 ft.), both glaciated and unglaciated; the limestone ranges and plateaus of the Pre-Alps and the Pre-Alps of lower altitude.

COASTS AND SEAS

The configuration of the coasts and the character of the seas as well as the general position and space relations of the coastlands are basic factors that affect the location, growth and functions of ports. In Germany in all these respects there are marked contrasts between the North Sea and the Baltic Sea.

The coast of the North Sea is a wide zone of transition between the mainland and the extreme limit of sea-water at the lowest tides. Between the two extremes are mud-flats that are exposed in varying degree at low tides and nearer the coastlands have been reclaimed at various dates since the Middle Ages. The sea floor shelves slowly and imperceptibly from the mainland, and a territory that is neither terra firma nor permanently under water lies between the two. These mud-flats are known as *Watten*. During high tides small vessels can cross the *Watten* from the islands to Hamburg and Bremen. At low tide the sea withdraws completely except for a few channels. Steep edges border the *Watten* only against the small channels (*Fahrrinnen*) in the estuaries where there are strong currents, as for example near Cuxhaven. In consequence of the rapid accumulation of mud, that reaches 3 m. per year at the mouth of the Elbe near Cuxhaven, the channels are constantly shifting their courses. Thus, the navigable channels must constantly be surveyed, and buoys that mark these channels must be

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FIG. 4—GERMANY: LAND FORMS (*from Maull*) (scale, 1 : 4 m.)

[For key see over

constantly shifted. There are, however, no sand barriers formed in the estuaries owing to the strong tidal scour. The coast proper is bordered by marshes or *Marschen*, drained and dyked, that have been reclaimed from the mud-flats or *Watten*. These *Marschen* border the lower courses of the rivers and have greatly facilitated the construction of modern port installations.

In general, the North Sea coast is quite unsuitable for navigation. In a straight line of 270 km. there are only three major estuaries—the Ems, Weser and Elbe—one minor one, the Eide, and one large embayment, the Jade. These estuaries also have no adequate protection by islands from the stormy sea. It is the general geographic situation of this coastline that has permitted the development of ports along it.

The south coast of the Baltic Sea is contrasted to that of the North Sea. Cliffs appear where *Geest* (p. 33) or dunes impinge on the sea coast or where the underlying rocks outcrop, as the chalk in the island of Rügen. The coast, however, is generally flat and the slope seawards from the low coastline is gentle, although within a short distance of the coast there is water deep enough for navigation. Since there are no tides in the Baltic there are no *Watten*. Glacial deposits cover large areas behind the coast, and wave action, coupled with the general easterly drift of the water along the south Baltic shores, accounts for the accumulation of sand-spits across the river estuaries, and the formation of delta deposits is favoured in the latter by the absence of tides. The resulting smooth coastline is well represented in Pomerania. The sand-spits are called *Nehrungen* and the sheltered waters behind them are called *Haffe*. Channels have been cut through some of the *Haffe* to afford deep waterways. Sunken embayments called *Bodden* occur in Mecklenburg and Vorpommern. Finally, at the western end of the Baltic are the *Förden*. These are of glacial origin and, like the fjords of Norway, are submerged areas of low relief and soft deposits that were formerly occupied by lobes of ice. They penetrate deeply into the land and have usually considerable and constant depths of water and, in consequence, make excellent harbours. The whole coast has thus many inlets that are suitable for navigation by small vessels, except for the river mouths, that have no tidal scour and are subject to the process of delta formation and are barred by sand-spits.

The North Sea is shallow and only recently extended southwards to submerge the coastlands. The Deutsche Bucht, the name of that section of the North Sea that lies in the southeast corner of the North Sea with Helgoland in its centre, is less than 40 m. deep. With the exception of a few rock outcrops that form islands such as Helgoland, the floor consists of mud and sands. The sea coasts are flat and gently shelving and there is a wide tidal range, so that great expanses of mud are exposed

at low tides and there are large stretches of shallow water near the coasts. Thus, in the West Frisian islands, depths of 5 m. are not reached until one reaches several kilometres from the shores. But a favourable feature of the sea is that it has outlets to the open Atlantic through the English Channel and to the north between the British Islands and the south-west of Norway. Unfavourable to Germany is the fact that the shores and islands of both outlets are under the control of non-German peoples.

The relative openness of the North Sea to the Atlantic is reflected in the temperature, salinity and tidal conditions of the waters, all three of which affect the navigability of the sea. In winter the temperature in the Deutsche Bucht does not fall below an average of 2–3° C. and the salinity is about 30 per 1,000. Thus, the North Sea waters do not freeze. Ice appears only in the severest winters near the coasts in the *Wattenmeer*. The estuaries of the Weser, Elbe and Ems rivers are thus navigable at all times of the year.

Tides spread to the North Sea from the Atlantic. This has a twofold consequence. The tides maintain the funnel shape of the estuaries and the strong ebb tides help to keep them relatively free of silt. Further, if sailing is properly timed, the estuaries can be used during high tides for both upstream and downstream navigation and during high tides the maximum depths of water allow large vessels to navigate the channels. The question of the construction of wharves or enclosed docks enclosed by locks is tied up with the tidal range. The average tidal range (German, *Herb*) is 2–3 m. At Helgoland it is 2.25 m., Bremen 2.42 m., Cuxhaven 2.84 m., Hamburg 2.17 m. The average spring tide, at the time of full and new moon, reaches 4 m. at Wilhelmshaven, and the neap tides, at times of half moon, only 1.84 m. at Helgoland. The tidal current averages over 3 nautical miles or 5 km. per hour.

The sea is exposed to storms, especially in the winter half-year. At

Fig. 4. GERMANY: LAND FORMS.

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| 1. Marsh | 18. Other lowlands not in the above categories |
| 2. Sand dunes | 19. Volcanic hills |
| 3. Cliff coast | 20. Depressions filled with recent deposits, valleys, and Alpine passes |
| 4. Low plateaus and hills (<i>Platten</i>) | 21. Fault scarps |
| 5. Glacial troughs | 22. Erosional scarps |
| 6. Terminal moraines | 23. Transverse gorges |
| 7. Outwash sands in front of 6 (<i>Sandr</i>) | 24. Areas of local glaciation |
| 8. Limits of early glaciation | 25. Limestone ridges |
| 9. Limits of latest glaciation | 26. Alpine Mountains, unglaciated |
| 10. North limit of loess | 27. Alpine Mountains, glaciated |
| 11. Highland | 28. Alpine Mts.—limestone ranges |
| 12. Higher land in 11 | 29. Alpine Mts.—limestone plateaus |
| 13. Lowlands of erosion in the highlands | 30. } Pre-Alps of medium altitude, |
| 14. Plateaus and scarps on horizontal sandstones | 31. } with occasional high rugged relief |
| 15. Lowlands in 14 | 32. Alps—lower altitude foothills |
| 16. Plateaus and scarps on horizontal limestones | |
| 17. Lowlands in 16 | |

this time of the year, southwest to northwest storms are frequent and are often associated with strong seas. The average wind strength at Borkum is 8 metres per second and 5 at Hamburg as compared with only 2 at Kassel. But wind strengths of over 30 metres per second are not seldom in the Deutsche Bucht. Sea floods are also common at this time. In the last hundred years only the years 1851 and 1910 were free of coastal floods. In 1868 there were 27 storm floods (*Sturmfluten*). At such times there are numerous shipwrecks and ships are often in distress both in the Deutsche Bucht and in the estuaries and harbours. For days on end small vessels are moored. Ships sometimes break from their moorings, and on one occasion at Cuxhaven a Hapag liner broke loose and carried half the quay wall with it. At such times, the roads and wharves of the harbour may be under water, warehouses flooded, and docks closed to ships. Storm warnings help to stave off some of these disastrous consequences. Fog and mist are also navigational difficulties. Thus, after two days of fog in March 1931, sixty sea-going vessels that were anchored in open water suddenly entered the mouth of the Elbe in three to four hours, where they had been held up until the fog lifted. In Borkum, there are sixty days of fog per year, three-quarters of which occur between October and March. In Hamburg there was an average of eighty-six days of fog from 1875 to 1925, and from 1875 to 1900 fog or mist occurred on every second day from October to February. In Hamburg this phenomenon is aggravated by factory smoke and by the shortness of the days in winter.

The Baltic is virtually a closed sea with three narrow outlets through the Kattegat to the North Sea. The best of these channels is the Grosse Belt. The Sund has a depth of a little more than 7 m. These entrances to the Baltic can be barred and this has been the principal reason for the struggles of the northern sea-powers, especially Denmark, to control the narrow channels. There is often a rapid alternation of shallow and deep water in the Baltic Sea. Thus, half-way between the Bornholm and Rügen islands there is a depth of only 6 m. and in the Lübeck Bay 6.5 m., and at the mouth of the Oder 7 m. The Baltic lands have also more continental conditions than the North Sea lands. The water temperature in winter has an average of only 1° C. The salinity is only a quarter or a third of that of the waters of the North Sea. Indeed, the water of the Bothnian Sea in the north is almost fresh. Thus, the Baltic waters freeze in winter, and have an extensive ice cover in extreme winters. Thus, in the winter of 1928-9 (in February and March) the northeast and east sections of the sea were frozen, and navigation was brought to a standstill in the southern waters. The harbours freeze every winter, and every year the small sea vessels of the German ports are at a standstill and navigation is difficult for larger vessels. The ports

in the north of the Baltic, such as Lulea in Sweden, are closed for three to four months and at this time the iron ores of northern Scandinavia go through the ice-free port of Narvik. The German *Seewarte* issues daily reports on ice conditions and daily ice charts, just as in the North Sea daily reports on storminess and fog are issued. Tides, on the other hand, are negligible. Storms and floods are far less frequent in the German Baltic than in the North Sea. Storminess, however, is more marked in the southwestern sector, for here northeasterly storms are frequent, associated with a high pressure system over Scandinavia and a low pressure moving from the Adriatic to southeastern Germany. Under these conditions storms bring to Lübeck and Kiel a rise of water-level of 2, 3 and even 4 m., that may cause extensive damage. Fog plays a small role. Neufahrwasser had an average of twenty-seven fog days from 1875 to 1900.

THE NORTHERN LOWLAND (Figs. 2 and 4)

The Northern Lowland of Germany is a portion of the great lowland that extends from the Artois Hills in Flanders to the Pripet marshes and thence into the lowlands of central Russia. Most of the area is under 100 m. in altitude, and only its zones of low hills reach more than 200 m., with a maximum height in the Turmberg, west of Danzig, with an altitude of 330 m. West of the Lüneburg Heath the plain has altitudes over wide areas of under 50 m. and there are no sharp slopes. But in the Lüneburg Heath there are differences of as much as 50 m. in local elevations, so that here one frequently finds a closely undulating surface relief, that is especially marked, with quite abrupt slopes, on the northern side towards the Elbe plain. These hilly characteristics are especially marked in the uplands east of the Elbe, as for instance in central Schleswig-Holstein, where local variations of relief of as much as 70 to 100 m. are found. The Northern Lowland is, indeed, low-lying, but it has considerable diversity of both relief and surface conditions. To the south, the lowland spreads towards the Central Uplands in a broad intermediate zone. Here there are three great embayments of lowland jutting into the Uplands. These are the so-called Cologne Bay and the Westphalian or Münster Bay adjacent to it; the middle Elbe basin, in whose centre lies the city of Leipzig, variously known as the Saxon or Leipzig Bay; and the Silesian Bay, that is drained northwards by the Oder and lies between the Sudetes, the eastern wing of the Bohemian Massif, and the western edge of the uplands of central Poland.

Surface Deposits. The surface deposits of the Northern Lowland are the results of glaciation. Superficial glacial deposits reach depths of 100 to 200 m., but Mesozoic rocks form the basis of the whole of the North German Lowland from the northern edges of the Central Uplands to

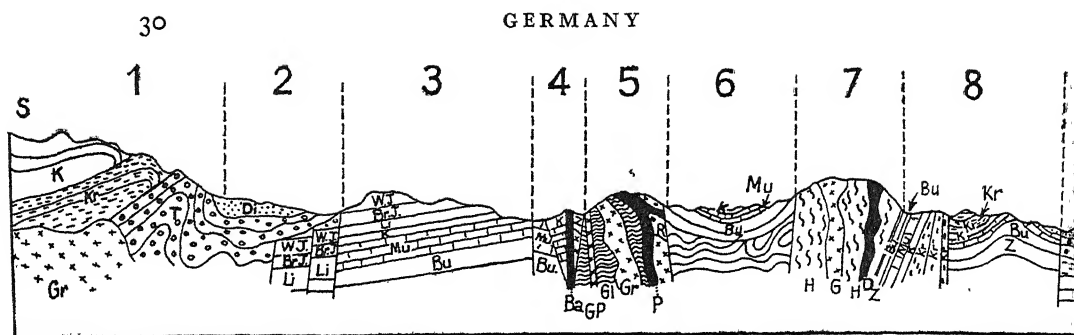


FIG. 5—GENERALIZED GEOLOGICAL SECTION ACROSS GERMANY FROM

Geological Divisions

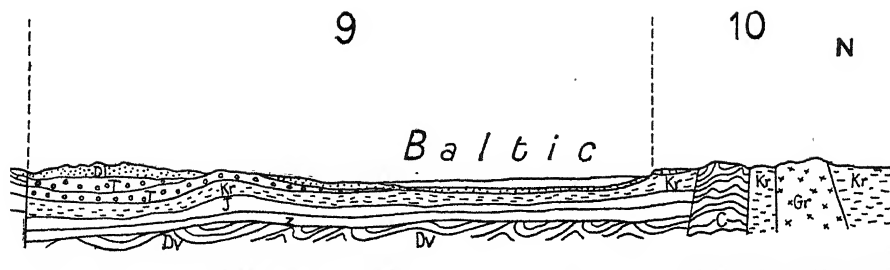
Gr = Granite
 G = Acid Granite
 GP = Granite porphyry
 Gn = Gneiss
 Gl = Mica schists
 P = Porphyry
 Ba = Basalt
 H = Paleozoic beds
 D = Diabase

Z = Magnesian Limestone (Zechstein)
 Bu = Bunter sandstone
 Mu = Shelly Limestone (Muschelkalk)
 K = Keuper
 Li = Lias
 BrJ = Brown Jura
 WJ = White Jura

the southern edges of the Fennoscandian Shield.¹ Moreover, the structural trends of this underlying land were from west to east and east-north-east to west-south-west, that is, in the general Hercynian trend and in the same direction as the Saxonian folding. Their relief undoubtedly affected and directed the movements of the great Ice Sheet, and, in consequence, the general disposition of morainic uplands and the great glacial spillways and river courses.

The Ice Sheet advanced in three stages with intermediate or interglacial phases. The oldest is called the Elster glaciation, the middle stage is the Saale glaciation, and the youngest is the Vistula glaciation. The first phase was the most extensive and reached south to Nijmegen, Cleve and Krefeld, where remnants of these oldest moraines form hills with eighty metres between their highest and lowest points. East of the Rhine, the ice front reached to the foot of the uplands, although it pushed south beyond them, for instance, across the Teutoburger Wald, and across the Lower Harz south to Erfurt, filled the Leipzig Bay, and stretched south up the slopes of the Erzgebirge to heights of 400 m. The limit of the most recent phase ran through the centre of the Jutland peninsula, thence eastwards parallel to the present coast to Schwerin and thence south through Neuruppin to Brandenburg, thence due east

¹ The underlying rocks frequently lie near the surface, and often actually outcrop. The Bunter sandstone outcrops in Heligoland. Limestone rocks (the Zechstein, Trias and Cretaceous) outcrop in the hills around which Lüneburg has grown. Moreover, the underlying rocks often lie near enough to the surface to permit the quarrying of chalk, as on the outskirts of Berlin, while salt and potash beds in the Magnesian Limestone (Zechstein) are bored in the district of the Aller river.



SOUTH TO NORTH (from *Seydlitzche Geographie*, 1925, pp. 4-5)

Dv = Devonian

C = Carboniferous

R = Red Sandstone (Rotliegendes)

Kr = Cretaceous (Kreide)

T = Tertiary (Molasse)

D = Diluvium (Glacial period)

Physical Regions from S. (left) to N. (right)

1. Allgau Alps

2. Bavarian Plateau

3. Swabian-Franconian Scarplands

4. Rhön

5. Thüringer Wald

6. Thüringian Lowland

7. Harz

8. Harz Foreland

9. Northern Lowland

10. Schonen (S. Sweden)

in a great curve slightly convex to the south and about forty kilometres south of Berlin, Frankfurt and Posen, so as to reach the Vistula near Plock. The western part of the lowland then lay beyond the reach of the ice and its glacial features have been broken down and modified by erosion since the earliest glacial phase when the ice retreated from it. Indeed, the great valleys formed by the rivers on the southern edge of the Ice Sheet drained westwards and converged near Havelberg and found their exit in what is now the lower Elbe valley, the greatest and most deeply cut of all the glacial troughs.

There are marked differences of land forms between the areas of Young Drift (*jungmöränen*) left by the Vistula glaciation to the north, and the areas of Old Drift (*Altmöränen*) to the west and south of the Lüneburg-Fläming-Lusatian moraines. Let us first notice the land forms of the Young Drift.¹ Ground moraines when weathered yield a loam containing many fragments called boulder clay (*Geschiebemergel*). The ground moraines were shifted about at the base of the Ice Sheet in various ways, so as to yield different kinds of surfaces when the ice retreated. Thus, there are the ground-moraine plains (*Grundmöränenebene*), that form extensive level or gently undulating surfaces. Probably the Ice Sheet was "dead" in these areas and gradually disappeared by melting rather than by the movement of retreat. Hilly morainic topography (*Kuppige Grundmöränenlandschaft*)

¹ P. Woldstedt, *Geologisch-morphologischen Übersichtskarte des norddeutschen Vereisungsgebietes*, 1:1,500,000, with explanatory text. Berlin, 1935. Also his *Norddeutschland und angrenzende Gebiete im Eiszeitalter*, Stuttgart, 1950.

has a maze of small, steep-sided hills and hollows, that often lack a normal drainage outlet and contain a lake or marsh. Such morainic deposits were formed on the edge of the Ice Sheet and merge into the terminal moraines. Drumlins are elliptical-shaped hills like a portion of an egg, elongated in the direction of ice movement. Terminal moraines accumulated during the main halting phases. Low, hummocky, irregular hills with a general curved direction lie parallel and adjacent to the edge of the ice. Melt waters provided lakes and troughs (*Rinnen*) as long sinuous strips. The troughs are especially characteristic of the edge of the Ice Sheet and run at right angles to the terminal moraines and are often parallel to each other, or form a fan-like network. They were mainly formed by sub-glacial melt waters (*Schmelzwasserströme*) that flowed at the bottom of the Ice Sheet near its margins. Freezing often preserved old beds and lakes at the bottom of the ice so that a complicated net of such lakes emerged, as in the neighbourhood of Berlin and in East Prussia. Glacial and river erosion combined produced lakes behind horse-shoe-shaped moraines; these are called tongue-basins (*Zungenbecken*). Similar to these are some of the *Förde* or sea-embayments, where the sea has invaded such a terminal moraine to the lake behind it (e.g. Apenrader Förde). Lakes of other kinds occur in the recently glaciated surfaces where the fresh glacial features have not yet been removed by normal erosion. Many of them occupy hollows that were left by the slow melting of residual blocks of ice, whose sites, in consequence, were protected from the deposition of material and thus formed hollows. Many are small dammed lakes (*Stauseen*) in which water-courses were blocked by moraines. Eskers are sandy ridges, like railway embankments: these were the beds of sub-glacial rivers and lie in the direction of ice movement at right angles to the terminal moraines. Kames are hills of sand and gravel that were laid down in hollows between ice blocks; they are very like terminal moraines. Fluvial-glacial deposits were laid down beyond the edge of the Ice Sheet and today form large flat stretches of sand and gravel that are called *Sandr*. Many of these deposits were formed by the same streams that occupied the *Rinnen* or troughs, the courses of which beneath the ice are revealed by strings of lakes. They were laid down as great delta fans beyond the terminal moraines, and become more sandy further from the latter.

These features are only found as fresh, unmodified land forms in the area most recently abandoned by the Ice Sheet. On the Old Drift, further to the south and northwest, they have been destroyed or modified by erosion. The melt waters, that created the *Sandr*, flowed in great troughs westward to the sea. These are called "old (glacial) river valleys" (*Urstromtäler*) and there is one such valley to each particular halting phase, although there are many interlocking channels between

the Elbe and Oder around Berlin. The floors of the valleys are covered with sands of different ages. Deep beds of sands and gravels, known as *Geest*, are cut into low platforms by the abandoned floors of these glacial channels.

Deposits differed in the country that lay beyond the Ice Sheet—the “peri-glacial deposits”. During the colder glacial phases the rivers laid down great masses of gravel (*Schotter*) and their association with climatic conditions is most marked in the terrace gravels of the Central Uplands (*Mittelgebirge*). The cold continental climate favoured atmospheric erosion and the rivers were loaded with debris. The rivers flowing north from the Central Uplands formed outwash fans (*Schwemmkegel*).

Loess, however, is the most important peri-glacial deposit. This is a bright yellow deposit that yields a sandy-loam soil, rich in lime, with a tendency to vertical cleavage. The general distribution is shown in Fig. 3. Loess is a wind-blown deposit that was laid down in pockets of lowland in the areas south of the Ice Sheet. It forms a belt along the northern edge of the Central Uplands, and covers basins and valleys in the Uplands, while in considerable tracts of country the surface soils show a loess component. With the loess should be included mixtures of loess and blown sand such as occur in northwest Germany, the Lüneburg Heath and the Fläming Heath.

Blown sands and dunes also accumulated on the edge of the Ice Sheet. They occur mainly in the great valley floors. The dunes are usually short and parallel to each other, curving to the east and southeast. The largest area is between the Warthe and the Netze rivers. Blown sands cover large areas in northwest Germany and Holland.

In the interglacial periods distinctive deposits were intercalated with those mentioned above. They had a fauna and flora that indicate milder conditions, comparable to those of today. There are interglacial bog, fresh water, lake and river deposits. The flora in the early stages of the interglacial change, when conditions were still very cold, includes the birch, later followed by pines, and then, in the middle of the warm phase, by hazel, elm, lime, oak, willow and hornbeam. These are then followed by the conifers and the birch as the next cold glacial phase developed.

From the twelfth century onwards, the land has been gradually reclaimed from the marshes of the shelving foreshores from northern France to western Denmark. This is most conspicuously the case in Holland, where engineering projects in the nineteenth century have permitted great inland marshes and shallow lakes well below sea-level to be reclaimed, beginning with the reclamation of the Haarlem lake and culminating today with the steady reclamation of the Zuyder Zee that was an inland lake until the fifteenth century. The same steady progress has

gone on in north Germany, where the reclamation of the marshes, as historical records reveal, began at the mouth of the Weser below Bremen in the twelfth century. Similar beginnings are recorded at the same time on the coast of Flanders, where the land immediately behind the coastal dunes, that lay below high-tide level, was drained by building sluice gates through the dunes to drain off the water at low tide.

Main Relief Units. The Northern Lowland embraces three main relief units—the Lower Rhineland, the lowlands of Lower Saxony, and the lowlands of eastern Germany, that lie beyond the Elbe plain and stretch south to include the Saxon Lowland in the middle Elbe basin. It contains the northern glaciated lowlands, and the loess zone between these and the Central Uplands. This latter zone is fertile, well-drained, arable land, and is known generally as *Börde*, though it has distinct regional names.

The *Lower Rhineland* lies in northwestern Germany, bounded by the Dutch and Belgian frontiers to the west (beyond which extend westwards the same types of country), and by the Weser Uplands to the east and the Rhine Massif to the south. The constituent units of this lowland are the Lower Rhine Plain, the Cologne Lowland (or Bay), and the Westphalian or Münster Lowland (or Bay). (Figs. 13, 14.)

The Lower Rhine Plain is a part of a great fan of alluvial deposition built by the ancestors of the Rhine and Meuse that has its apex in the head of the Cologne Bay, and broadens out northwards to include all the Lower Rhineland and much of Holland and northern Belgium. The present rivers have incised their courses into these deltaic sands and gravels in several stages, so as to form three main terraces, that generally decrease in altitude northwards from the Cologne Bay. The upper terrace (*Hauptterrasse*) contains the oldest gravels and lies at the highest levels, forming raised platforms of sandy and gravelly, forested land. Such areas occur on the eastern side of the Rhine between it and the slopes of the Rhine Massif, while on the west side there is a raised "horst" or ridge called the *Vorgebirge* or *Ville* that trends from southeast to northwest. The middle terrace (*Mittelterrasse*) is below the upper terrace and has a smooth relief and is often covered with loams and loess and is, in consequence, generally under cultivation. The lower terrace (*Niederterrasse*) lies only a few metres above the flood level of the Rhine. The river flood plain widens below Cologne and the river frequently shifted its course until it was diked and the flood plain drained in the fourteenth century and after, while the main channel has been dredged, deepened and embanked since the nineteenth century. The river plain below the confluence of the Lippe is in fact an extension of the Dutch polder land (German, *Marschen*) and widens out in central Holland to form the land called the *Betuwe* that lies between the raised sandy heathlands of the *Veluwe* to the north and the *Campine* to the south. Isolated

hills rise above the surface of the upper terrace and stretch in a chain from near Nijmegen south to Cleve and thence to Xanten. At various points the Rhine undercuts both the high terrace and the unconsolidated masses of sands and gravels of which these hills are composed. These river bluffs are frequently the sites of towns, such as Arnheim, Nijmegen and Cleve.

The Cologne Lowland is a V-shaped, loess-covered embayment in the northern border of the Rhine Massif. The only break of relief is afforded by the narrow ridge of the Ville. This is a faulted horst remnant of the upper terrace (*Hauptterrasse*).

The whole lowland narrows westwards towards Aachen where it is overlooked by the high and steep front of the Hohe Venn plateau. The Aachen Lowland is a peneplain developed on chalk beds, that corresponds in altitude with the high terrace. It is interrupted by valleys that follow fault troughs directed again from north to south, each filled with Tertiary deposits and forming a meadow-filled valley with steep wooded sides. The Wurm and the Rur are such valleys. Above the open plain rise the wooded chalk hills of the Aachen Wald (350 m.) that overlook and enclose the town in its great saucer-shaped depression.

The Westphalian Lowland is developed on a fundament of marls, limestones and sands, that form a shallow syncline, plastered in its centre with glacial deposits. The beds are almost horizontal on the southern side, where the outcropping limestones form a long, narrow east-west strip of undulating, dry country. This country is known as the Haarstrang. It ends to the south in a well-defined scarp that overlooks the green wooded valley of the Ruhr, beyond which lies the rounded skyline of the Sauerland. To the north, impervious clays form the lowlands of the Emscher and Lippe, and on the northern edge of the Haarstrang at the zone of contact of clays and limestone there is a very well-defined line of springs. On the north side of the syncline the rocks are steeply tilted on the southern slopes of the Teutoburger Wald, but extensive areas of fluvio-glacial gravels, 22-28 m. thick, form a lowland zone of heath called the Senne on the southern side of the hills. The centre of the lowland around Münster is plastered with glacial deposits although low hills betoken the presence of the underlying chalk rocks.

The *Lowlands of Lower Saxony* embrace from north to south the flat, reclaimed coastal marshes, the zone of intermixed bog and heath that is developed on a general base of glacial sands and gravels, and the loess-covered lowland strip that lies on the border of the *Mittelgebirge* from Osnabrück to Magdeburg (*Börde*). The Marsch zone extends from the west of Schleswig-Holstein, through the lower Elbe, along the coast to the lower Weser, and thence westwards to the lower Ems and into northern Holland. The flat lands are frequently overlooked inland by the sharp

edge of the Geest as in the case of the lower Weser below Bremen (Fig. 85). The Geest sands rise to gentle upland surfaces to 50–70 m., as in the Hummling north of the Hase river (73 m.), though there are extensive flats around this nucleus that were the former floors of glacial troughs and are now ill-drained bogs. To the south between the Ems and Hunte rivers the relief is interrupted by low hills with altitudes of 100–150 m. that are outliers from the Weserbergland to the south. The southern limit of the Geest against the loess country is definitely marked in the landscape along a line from Hanover through Minden to the foot of the Wiehen Gebirge north of Osnabrück. The Lüneburg Heath is a morainic upland between the Elbe and the Weser-Aller, with an average altitude of 80–100 m. and a maximum height of 169 m. in the natural park of Wilsede. It has steep slopes overlooking the Elbe plain, that is fretted by many little wooded valleys, whereas it slopes gradually to the low-lying bog and heathlands on the low Stade Geest to the north, and the Altmark to the southeast, where hills (160 m.) and bogs (*Drömling*) are intermingled.

The *Eastern Lowlands* beyond the Elbe owe their features almost entirely to the varying blankets of glacial and fluvio-glacial deposits and the subsequent work of weather, river and wind. They include the glaciated relief of the northern section of the lowland that lies east and north of the Lüneburg Heath-Fläming Heath-Lower Lusatian Heath and their eastward continuation in the Katzegebirge.

This is the most southerly belt of a series of uplands and troughs that swing from west to east as great arcs convex to the south. It is sometimes referred to by geologists as the Outer Baltic Ridge. The main belt to the north is generally known as the Baltic Uplands or the Inner Baltic Ridge, and extends from Schleswig-Holstein to East Prussia. Between these two belts are the marshy valley troughs and low diluvial platforms that are associated with the glacial rivers that flowed westwards on the edge of the Ice Sheet. This country is best developed in Brandenburg between the Elbe and Oder rivers. The direction of the old troughs (*Urstromtäler*) is indicated by the east-west courses of the main rivers and their tributaries, while their south-north courses indicate the shifts of their channels through the terminal moraines as the Ice Sheet retreated northwards.

The main troughs from north to south are: (1) Thorn-Eberswalde valley and its continuation in the Wartha and Oder valleys; (2) the Warsaw-Berlin valley, that includes the Spree-Havel west to the Elbe; (3) the Glogau-Baruth trough to Burg on the Elbe; and (4) the Breslau-Magdeburg valley, south of the outer ridge.

South of the Fläming and Lusatian uplands there is entirely different country. The great stretches of sands and clays through which the Elbe

winds its course across an extensive flood-plain, is the most southerly of the great troughs. Beyond it lies the Saxon Lowland. This is a great embayment that pushes south into the circle of uplands formed by the Harz and Erzgebirge. It has a base of horizontal Tertiary beds that contain great deposits of lignite. It is the focus of the drainage from the surrounding highlands and merges gradually into the low plateaus of Triassic sandstone and limestone along the Saale, and the Saxon uplands to the south. An extensive loess cover blankets this border and produces everywhere a similar landscape—rolling land under arable cultivation, hedgeless fields and compact villages. This is the biggest expanse of the *Börde* country.

CENTRAL UPLANDS (*Mittelgebirge*) (Figs. 13, 14)

The term *Mittelgebirge* means uplands of “medium” altitude. They are intermediate in both altitude and position between the lowlands, which are below an average altitude of 200 m., and the Alps or *Hochgebirge*, where most of the land is over 1,000 m. in altitude. The summits of the highlands of the *Mittelgebirge* seldom exceed 1,000 m., although the relief is actually extremely varied.

The Central Uplands, as generally interpreted, cover the whole of the country between the Northern Lowland and the Alps. They thus cover the greater part of Germany. The western half is drained northwards by the Rhine and its tributaries, and the centre by the Weser and its tributaries, while the southern sector, lying for the most part in Bavaria to the north of the Alps, is drained eastwards by the Danube from its source in the Black Forest. This area contains rugged highlands, cultivated plateaus, wooded sandstone plateaus, wooded scarps, and fertile vales and lowlands and uplands. But a glance at Fig. 2 (p. 16) reveals that the whole falls quite clearly into two sections, one in the north that is formed by the main highland massifs—the Rhine Massif and the Bohemian Massif with the trough of Hesse between them; and the southern section that lies south of these massifs and stretches to the foot of the Alps. We shall, in fact, regard the Bavarian Plateau as a separate main division in our treatment.

CENTRAL GERMANY

The *Mittelgebirge* proper include the great Rhine Plateau or Massif; the knot of uplands that radiate from the Fichtelgebirge; the isolated outlier of the Harz; and the lower hills, ridges and lowlands of the so-called Weser Uplands (*Weserbergland*) between them, including the vol-

canic highlands of the Rhön and the Vogelsberg; and the west and east Hessian lowlands that flank these highlands. This east-west belt of highlands is traversed by the Rhine and Meuse in the west, the Weser-Leine system in the centre and the Elbe-Saale system in the east. It has a width of about 150 to 200 km. It should be noted, however, that these highlands never were effective barriers, but from early times have been traversed by routeways. The central area drained by the Weser-Leine system is the old province of Hesse that has always been a great zone of human movement from north to south between the Rhine Massif and the Thuringian Highlands, Fichtelgebirge and Bohemian Plateau. Of the greatest importance is the route along the Rhine gorge between Bingen and Bonn, but many lesser routes crossed both the Rhine Massif and the Thuringian Highlands and the highland knot of the Fichtelgebirge.

The outcrops of the rocks and the lie of the relief indicate certain definite structural trends. A trend from northeast to southwest is evident in the rock outcrops and the relief of the Rhine Massif. On the other hand, the Harz and the Thuringian Highland have a northwest to southeast trend, that is due to faulting, and cuts across the grain of the northeast to southwest rock outcrops. The same northwest to southeast trend is evident in the so-called Harz Foreland on the northern side of the Harz, north as far as the Flechtinger *Höhenzug*. The fault lines of the Hessian and Weser uplands are for the most part directed from north to south.

Moderate altitudes are dominant, the average being about 400 m. Few points are over 1,000 m. Rolling surfaces and gentle undulations rather than mountainous relief are characteristic. The plateaus are sometimes deeply dissected, however, as in parts of the Rhine Massif, so that they may assume quite a mountainous appearance, although the concordant and rounded summit levels reveal the form of the initial uplifted plateau surface. Steep-sided ridges are characteristic of the Weser Uplands and the Harz Foreland where Mesozoic limestones and sandstones are steeply tilted to form monoclinal ridges that often have a bold relief, though they are low in altitude. Deeply entrenched meanders, such as those of the Rhine and the Moselle, are characteristic in the Rhine Massif.

The *Rhine Massif* is an uplifted plateau with a smooth or rolling relief, traversed by deeply incised valleys, the chief of which are the Rhine, the Moselle and the Lahn. The plateau has large surfaces with an average altitude of 200–400 m., while above this level rise the main highlands with maximum altitudes of 650–700 m. in most of the plateau, and 800–900 m. in the Taunus and Hunsrück in the south and in the Rothaargebirge in the northeast. Certain areas are deeply dissected, such as the Ahrgebirge, so as to present a quite formidable mountainous character, although there is a striking uniformity of the skylines and remarkable similarities between the many valleys. Elsewhere, rougher highlands stand

up from this general base owing to the resistance of their hard rocks that trend from northeast to southwest. Then again there are areas of smooth and lower-lying relief on the plateau that are due to differential erosion or to faulting. Volcanicity, too, has added its contribution to the land forms, for not only are there the typical explosion crater lakes on the Vor Eifel, but there are extensive basalt plateaus in the Weserwald east of the Rhine.

The development of the land forms is complicated and views are at variance as to their origin but their main characteristics in the geographic sense are clear. Below the highlands of residual, resistant rocks (especially quartzites) lies the uppermost and oldest peneplain, that was called the *Trogfläche* in 1899 by Philippson. It is the pre-Pliocene surface on which the Rhine and Moselle pursued their meandering courses in Pliocene times, evidences of which appear in high terrace gravels (*Flurterrassen*) at 200–240 m. and 300–315 m. Subsequent erosion by the rivers resulted in the formation of the middle terrace (about 140 m.) and the low terrace (about 80 m.) along the valleys.

The *Weser Uplands* lie between the Rhine Massif and the Harz. An outstanding feature of the relief of this zone is the northwest-southeast trend of its short, low, but steep-sided and wooded hills and uplands. These rise above the lowlands, flat or undulating and closely cultivated, that surround them, as a sea lapping around many elongated islands. The Weser Uplands proper lie between the Teutoburger Wald and the Wiehen Gebirge which converge to the northwest and face each other with inward-turned scarps. These overlook undulating lowlands of Keuper and Lias marls and clays across which meander the tributaries of the river Weser that cuts through its famous water-gap at Minden. This whole area is, in simplest terms, an eroded anticline, comparable with the Weald. These may be called the Westphalian Uplands. To the east, between the Weser and the Leine, and extending beyond the south-north Leine along the north of the Harz, is the zone *par excellence* of the northwest-southeast ridges, rising from loess-covered plains. The latter are closely settled and afford open natural highways southwards into the heart of the Hessian highlands. This unit we shall call the Eastphalian Uplands. It reaches north to Hanover and Brunswick and extends eastwards as a zone on the northern side of the Harz. (Fig. 13.)

The third main relief unit lies to the south and stretches as far as the junction of the Fulda and the Werra. The flat and wide lowlands are now a minor element in an area of upland relief that is traversed by the master valleys of the Weser and the Leine, both of which drain from south to north. This whole country is composed of several outstanding and remarkably repetitive forms of relief. There are relatively high and inaccessible plateaus of horizontal sandstones that are still predominantly

forested. There are more occasional limestone uplands in which, though well wooded, there is a good deal of cleared and cultivated land. There are the two sunken wide, open troughs of the Weser and the Leine. These are lower in altitude and smoother in relief, and are in part filled with loess deposits and form areas of arable cultivation and close settlement. These are the Leine Uplands.

The Weser Uplands merge southwards beyond Kassel into the *Highlands and Lowlands of Hesse*. The troughs of the Weser and Leine are continued southwards by small lowland compartments. One is followed by the Fulda and its southerly continuation through to the Wetterau at the northern end of the Rhine Plain. The other lies along the north-south valley of the Leine and is continued south (beyond the end of the Thuringian Highland) in the upper Fulda valley. These are two structural depressions, known as the West and East Hesse Depressions respectively. Between them, south of the Werra valley, are the sandstone plateaus of the Meissner and Knüll, and the volcanic massif of the Vogelsberg, while east of the upper Fulda lies the volcanic massif of the Hohe Rhön. These highlands, together with the two depressions, form the outstanding features of the relief of Hesse. East of the Rhön are limestone uplands, studded with volcanic hills that surround it: this is the Vorder Rhön. Beyond the latter lies another narrow lowland between it and the Thuringian Highland. This is followed by the upper course of the Werra and affords access southwards to the limestone plateaus of Franconia. This may be called the Upper Werra Lowland. It will be clear why this whole area of Hesse was always of such great importance as a corridor of movement across the Central Uplands.

SOUTHERN GERMANY

The great area south of the central German highlands as far as the Alps shares the same *general features* as the former, except that the high plateaus are less extensive and lowlands cover a much larger area. Both the Variscan and Hercynian strikes are evident in the relief, while faulting from north-north-east to south-south-west determines the direction of the Rhine Rift and the plateau blocks on either side of it. The foreland of the Alps in Bavaria and in Switzerland forms a distinct geological and physiographic unit.

The relief of south Germany as a whole has several outstanding characteristics. The first is that the low level of the Rhine *graben* or rift offers a low basis of erosion for the tributaries of the Rhine. These tributaries thus have much greater cutting power than the tributaries of the Danube, since this river has higher levels than the Rhine, its height at Passau being 290 m. above sea-level as compared with 85 m. at Mainz.

The second is that the *degree* of relief, measured by the average interval between the highest and lowest points in short distances of 5 km., is 200–500 m. in nearly all the uplands. Only parts of the Black Forest have a higher and more deeply dissected relief. Thirdly, the flat areas, the real plains, with a degree of relief under 50 m., include, above all others, the Rhine Rift from Basel to Mainz and its extension northeastwards from the Main-Rhine confluence in the Wetterau. Smaller areas lie along the Danube and in the centre of the Bavarian Plateau. The latter, however, is normally undulating or even hilly with a degree of relief of 50–200 m. and is in this respect comparable with the greater part of the whole area of southern Germany.

Geologically, the old uplands (*Grundgebirge*) consist of gneiss, granites, schists and porphyries. Above these comes the sequence from Triassic to Cretaceous, and Upper Tertiary beds appear in the Bavarian Plateau. To these must be added the erupted volcanic deposits. Of great importance in the development of the land forms of southern Germany is the relative resistance of these rocks to erosion and their permeability or impermeability. In this respect, the rocks of southern Germany may be classed as in the table on p. 51 in which are shown the age of the rocks, their lithological character, and the salient features of land use and settlement.

The main geological elements are as follows: (1) the *Grundgebirge*, consisting of granites and gneisses, folded at the end of the Carboniferous period; (2) the gently folded Mesozoic strata that, to the eye in the field, are horizontal; (3) the Tertiary and Quaternary deposits that were laid down in the geosynclinal of the Alpine foreland and the Rhine Rift Valley—marine, lacustrine and glacial deposits; and (4) the recent Tertiary folded system of the Alps.

The *Grundgebirge* comprise Black Forest, Vosges, and the highland borders of the Bohemian Massif. These are uplifted plateau blocks in which differential erosion has worked upon adjacent outcrops of varying resistance, so that the hard quartzites stand out as residual ridges as in the Taunus, whereas the soft Carboniferous schists form areas of lower and smoother relief with broad mature valley floors in the plateaus. Where there are sharper, outstanding ridges, as in the Böhmer Wald, these are likely to be due to recent faulting. Upper Carboniferous and Permian strata are to be found in a geosynclinal stretching from the Saar across the Pfälzerwald to Frankfurt and thence to the northern end of the Thüringerwald. These strata are varied and give a variety of relief features, but at the end of the Paleozoic there was very little difference in altitude and surface between the peneplained surface of the *Grundgebirge* and the Permian geosyncline. This surface is called the pre-Triassic peneplain (*Prätriadische Rumpf*). Mesozoic strata were laid down

on this submerged peneplain, which is now exposed on the edge of the Bunter sandstone (the lowest of the Triassic series) where it forms a denudation platform with a spring line at the base of the sandstone. Such outcrops occur near Heidelberg and in the west of the Spessart and in the whole of the northern Black Forest. These Mesozoic strata stretch westwards from the Vosges across Lorraine towards the Moselle valley and eastwards in south Germany to the extensive plateaus of the Jura. They also stretch as horizontal platforms throughout Hesse and east as far as the Thüringerwald and the Frankenwald. Beyond the Jura the strata dip gently towards the basins of the Naab and the Danube. These Mesozoic (Triassic and Jurassic) deposits were laid down in shallow seas that advanced and retreated with varying depths between one land mass to the southwest and another to the northeast, so that the axis of the sea reached from northern France to the south of the Bohemian Massif. The sea persisted longest in the southeast where chalk was laid down and is still preserved in the Oberpfalz, the Swiss Jura, and the Alps. The secular uplift of these horizontal strata resulted in differential erosion that continued without interruption from Jurassic into Tertiary times. The process of erosion, with the backward recession of the scarps, had gone far before the formation of the crack of the Rhine Rift.

Movements in the Oligocene and Miocene periods resulted in the present relief. These movements were associated with the Alpine uplift. Extensive west-east upfolds occurred in the Vosges and Black Forest and in the Hardt-Odenwald-Spessart, while between these two upfolds stretched a depression with its axis on the Zabern Pass and the Kraichgau in which younger sediments have been preserved from erosion. In the uplifted areas the rocks were heavily eroded and the pre-Triassic peneplain of the *Grundgebirge* was exposed. These older and more resistant blocks resisted folding, but fractured so as to form uplifted tilted blocks (*horsts*) and sunken troughs (*gräben*) and well-marked fault scarps. It was at this time that the formation of the north-south crack of the Rhine Rift commenced, with the accompanying uplift of the blocks or horsts on either side of it. The Thüringerwald is a narrow horst block. The Böhmerwald and the Bayerischerwald have a succession of parallel step faults running northwest to southeast so that the blocks have steep fault-scarp-slopes to the southwest and a gradual tilt to the northeast. The Fichtelgebirge has intersecting faults and its keel is tilted up to the highest altitudes at its western end and slopes gently inwards. The uplands bordering the Rhine trough have steep fault scarps facing inwards and gradual-tilted slopes outwards.

The Oligocene coastal deposits herald the beginning of the formation of the Rhine Rift and these deposits reach from 450 m. above to 1,600 m. below sea-level. The formation of the Rift proceeded in stages, uplift

alternating with long periods of stability and erosion, during which the highlands were denuded and the basins filled in with the detritus. The Upper Miocene and Lower Pliocene was a long period of stability during which valleys were widened and a distinct peneplain level formed in the flanking highlands. At this time there was not such a sharp contrast in altitude between the southwest and the southeast of Germany. Moreover, the Mesozoic sea, that had steadily retreated southeastwards, now in Tertiary time occupied the geosyncline on the northern border of the Alpine mountains. At the same time a sea spread over the site of the Rhine Rift. Thus the drainage of the whole area was either to the one sea or the other. At this time the rivers rose far to the northwest, on the slopes of the Black Forest, and drained down the dip slope to the sea on the site of the present Danube plain. As this sea was filled the Danube gradually picked its course across the plain cutting through the older rocks where it impinged on the Jura. As the Rhine Rift sank, however, and as the Danube sea was filled, the cutting power of the northerly flowing rivers was increased and they captured the headstreams of the southerly flowing streams. This process has continued since and may still be observed today. The watershed has shifted towards the south and southeast, and, further west, the waters that formerly drained south-eastwards across the Burgundian Gate were eventually diverted northwards to form the present course of the Rhine.

Erosion since the Pliocene has been relatively small and there has been little earth movement. Earth movements have continued on the borders of the Rhine Rift; and glacial deposits are to be found near Heidelberg 300 m. below sea-level. Glaciation affected the Bavarian plateau but the highland blocks had only very small local glaciers. In the sheltered lowlands and valleys wind-blown loess deposits were widely spread, especially in Swabia, Franconia and the Rhine valley. These deposits were high-water muds (*Hochwasserschlamme*) that were redistributed by the winds in the severe, dry winters. At the same time dunes were formed in the low-lying valley areas as in the lower end of the Rhine Rift valley.

We may now turn to a brief portrayal of the land forms of the three main units of southern Germany: the Rhine Rift and its flanking highlands, the scarps and vales of Swabia and Franconia, and the Bavarian Plateau.

The *Upper Rhine Plain* extends for two hundred miles from Basel to Bingen and has an average width of twenty-five miles. The Plain is embraced by wooded highlands to east and west and is barred to the north by the Taunus-Hunsrück and to the south by the Jura. Lowland routeways in breaks between the several highlands, as well as the valley of the Rhine itself to north and south, afford exits from the Plain. It is a nexus of natural routeways with outstanding foci in the north, centre

and south. Of these the Mainz-Frankfurt focus in the north is the most important. These lowland exits are the Wetterau in the northeast, the Belfort Gap in the southwest, the Kraichgau in the east-centre, the Zabern Gap in the west-centre. The Naabe valley to the west, and the narrow valley exits of the Rhine, Main and Neckar, cut through the engirdling highlands.

The Rhine Plain is a deeply sunken trough, bordered by the fractured edges of the highlands. It has been filled to great depths with alluvial sands and gravels, into which the Rhine has incised its shallow bed. There is in consequence a north-south alignment of terrains. These are the foothills, the loess platforms, the diluvial terraces, and the alluvial plains of the present river-beds.

A blanket of loess covers considerable areas of the low terrace between the central plain and the foothills. It is especially extensive on the western side from the Rhine-Hesse uplands southwards to the area that lies immediately behind Strasbourg. It provides this city with dry inland connections with the Zabern Pass direct from its site on the banks of the Ill near its confluence with the Rhine. On the east side of the Plain the loess deposits occur as a few patches in Breisgau, but are unimportant to the north.

Highlands flank the Plain to east and west. The Black Forest extends from Basel to Pforzheim but the rough highland relief ends with the Murg valley. Its valleys drain partly to the Rhine and partly to the Neckar, but several small rivers drain south to the Swiss Rhine. A main river, the Murg, drains to the north on the eastern margin of the highland, while the Kinzig and the Dreisam penetrate deeply into the highland from the Rhine Rift and afford the chief routeways across the highland. Physiographically, the Black Forest has its nucleus in the rugged granite highland, whose rounded summits reach their highest altitude in the Feldberg (1,493 m.), and north of this point summit levels have a remarkably consistent height of 900-1,000 m. Northwards, however, the name Black Forest also includes the wooded plateau of horizontal sandstone that caps the pre-Hercynian base (the crystalline *Grundgebirge*) west of the Murg valley.

Between the Black Forest and the Odenwald there is a zone of open undulating country that has a floor of Muschelkalk limestone and a cover of loess. It drops by 100 m. to the Rhine Plain and slopes gently eastwards where it is bounded by the valley of the Neckar-Enz, sunken by some 150 m. This is a structural continuation of the Zabern *Bruchfeld* behind Strasbourg on the opposite side of the Plain. It is called the Kraichgau. The Spessart and Odenwald correspond in location and character with the Haardt on the west side of the Rift. They are plateaus of horizontal sandstone that are cut by the gorges of the Main and the

Neckar and merge northwards, beyond the Kinzig valley, into the wooded volcanic uplands of the Vogelsberg and Rhön. In the western Odenwald and Spessart the crystalline rocks come to the surface and give rise to a much more dissected undulating country than the sandstone plateau.

The *Pfälzer Wald (or Haardt)* extends from the Zabern Pass to the scarp that overlooks the Kaiserslautern-Landestuhl trough. Its high scarped edge overlooks the Rhine Plain from heights of 600–700 m., while its long dip slope results in a well-wooded sandstone plateau. The sandstones are in parts deeply weathered to give rise to bizarre castellated forms. The valleys in the south reach softer red sandstones and are broader than the valleys in the north, that are deeply cut into the Bunter sandstones. The east–west scarp to the north (where Muschelkalk caps in part the main outcrop of Bunter sandstones) overlooks the trough of the *Pfälzer Gebruch* beyond which lies the *Pfälzer Bergland* or Saar-Nahe Uplands. This latter is a zone of relatively open, undulating country, 30–40 km. wide, that lies between the Haardt and the Hunsrück and is drained eastwards by the Naabe river. It is formed of Permian marls and Carboniferous clays so that it has a gentle relief of 200 m. in depth as compared with 300–500 in the Haardt. Resistant volcanic rocks stand out from this lowland as steep-sided wooded ridges.

We may next turn to the *South German Scarplands*. The scarplands between the Black Forest-Odenwald-Spessart and the Bohemian Massif and the Danube are marked by a sequence of gently sloping geological deposits from west to east that embraces the whole of the Triassic series. The details of the succession and the types of relief and land use associated with them are indicated in the table at the end of this chapter.

The whole of this area is divided into two sections by the east–west zone of Keuper sandstone hills, from Heilbronn to Crailsheim, south of which lies the Swabian area of the Neckar basin, and north of which lies the Franconian area of the Main basin. Heilbronn and Hall command gaps in this west–east line of hills where the Neckar and Koch rivers enter the lowlands on their northward course. In the Neckar basin there are the open undulating surfaces of dry limestone and gypsum marls country that is often covered beneath a blanket of loess. These are known in the Neckar basin to the south as the *Gäue*. In the Main lands to the north these areas are wider and bear such names as Hohenlohe Ebene, Taubergrund, Bauland and Grabfeld. The valleys are usually quite clearly defined, well sunken to a depth of 50–100 m. with steep sides. Here concentrate vineyards, in contrast to the arable lands on the plateaus. This zone is limited to the east in the Franconian section and to the southeast in the Swabian section by the much-broken sandstone hills, wooded and moist, with scarp slopes facing to the east. These are the Keuper sandstone hills that are referred to individually as *Berge*.

The sandstones are often overlain by impermeable marls. These give rise to wooded and marshy lands east of the Frankenhöhe and Steigerwald, sloping to the depression of the Rednitz valley. Next to this zone of broken hills in the Neckar basin and lying on their eastern slopes are open undulating lowlands that lie between these hills and the next great dissected scarp to the east. This zone is called locally in Swabia the *Filder*. The name may be given to the whole of this belt at the foot of the Alb scarp. Next to it to the east is the deeply dissected scarp front of the high Alb.

The *Alb* is some 40 km. wide. In the Neckar basin it is a zone with a frequent alternation of outlying plateau remnants, deep valley floors and re-entrants, and long irregular slopes that vary according to the outcrop of the horizontal strata. The whole scarped zone has a depth of dissection of 500 m. and over (altitudes of 800–1,000 m. in the plateau down to 400 m. in the valley floors). The Alb is a high limestone plateau that engirdles the whole area of the Neckar and Main we have so far considered. It is undulating and waterless, with shallow dry valleys, deeply incised master valleys, and some small volcanic hills (laccoliths). Beyond the Franconian Jura is the lowland trough of the Naab, beyond which again rises the wooded and often boggy highland of the Böhmer Wald, the Fichtelgebirge, and the Thüringer Wald. The Naab lowland is mainly undulating lowland with heavy loam and clay soils. It is wet, strewn with lakes and thickly forested with coniferous trees. It is comparable to the country on the Keuper marls west of Bamberg and Nuremberg. The Swabian Alb dips gradually southwards to the Danube. Its surface is interrupted by the fertile lowland of the *Ries* that lies as a circular depression, and is probably a gigantic volcanic explosion crater, at the junction of the Swabian and Franconian Jura.

The *Bavarian Plateau* has been built up by glacial deposits, laid down by valley glaciers and fluvio-glacial rivers, issuing from the Alps, on the preceding relief on the Molasse deposits. Thus, we are able to distinguish several clearly defined west-east belts of country. There are the uplands of Lower Bavaria, developed on the pre-glacial surface of the molasse beds, that stretch from Augsburg to Linz. The Iller-Lech Plateau contains a frequent alternation of broad valley floors incised into a raised platform of old sands and gravels. The zone of morainic country, with hummocky moraines and marshy floors and bogs and lakes behind them, runs from west to east as the so-called Upper Swabian-Upper Bavarian Uplands. The plain of Munich forms a distinctive element here. It is the most extensive of the plains of gravels and sands that were laid down by the rivers issuing from the Ice Sheet (*Schotterfeld*). Similarly distinctive are the areas of flat bog-land that form a series along the Danube lowland to the north—the Donaured, Donaumoos and Dungau.

THE BAVARIAN ALPS (Fig. 4)

The Alps extend along the south of the Central Uplands between the latter and the Po basin. The German-speaking peoples cover a major part of this great area that includes two-thirds of the population of Switzerland and the great part of the population of Austria, including the Drave valley and the southern Tyrol south of the Brenner Pass. But only a small section of it lies within the frontiers of Germany. In the Austro-German section or the eastern Alps, east of the St. Gotthard Pass, an east-west alignment is characteristic of the relief features and of the drainage. A greater central belt of lofty mountains is bordered by wide valley troughs to the north and south and these in turn are succeeded by belts of lower, forested limestone and sandstone plateau blocks that are broken into segments by transverse valleys. The Bavarian Alps embrace a section of the northern part of these two outer belts of the so-called Prealps. The frontier pursues a sinuous course between Lake Constance at its western end at Bregenz to a little west of the Salzach valley where it quits the Alps to follow northwards the valley of the Salzach. The frontier does not follow the watershed throughout. South of it lies the trough of the Inn valley. Crossing the Prealps, the frontier includes on its northern side the embayment of the upper Iller, that embraces the district known as the Allgäu, then crosses the upper valley of the Lech and the headstreams of the Isar as far as Kufstein on the Inn. Beyond here it again crosses the heads of northward-flowing rivers and finally makes a southerly embayment to include Berchtesgaden on the west side of the Salzach before turning north.

There is a great diversity of relief in this narrow strip but its outstanding feature is the dominance of limestone country. These limestone rocks are practically horizontal and form block-like plateaus that are heavily forested, or even barren karst, and patches of cultivated land are a rarity. Moreover, with the exception of the Allgäu, there is little use made of the higher summer pastures owing to the shortage of water. A quarter to a third of the whole area is unused.

The mountains are arranged in *culées*. In the foreland, broad, wooded, but partly cultivated uplands are cut by valleys into separate blocks, rising from the plain by 300 to 600 m. In the west, the uplands consist of sandstones (Molasse, Nagelfluh, and Flysch). Behind these rise long ridges of limestone and dolomite, that are cut less frequently by deeper and narrower valleys. Here occasional summer pastures rise above the tree-line and bare rock slopes also occur. The maximum heights reach 1,800 m. Behind these again rise great grey rock slopes which hold snow in patches right through the summer. They consist of limestone and reach altitudes of 2,000 m. but nowhere reach 3,000 m. These peaks

alone can be reckoned with the Hoch Alpen or High Alps. The remainder are within the Voralpen or Prealps. Longitudinal valleys also emphasize this arrangement of the relief, that is in considerable measure an adjustment to the east-west folding that increases in intensity southwards. Eastwards the northern outer zones gradually fade out beneath the Bavarian Plateau and are succeeded by ranges that push northwards. Thus, the molasse zone, that reaches heights of 1,800 m. in the Allgäu, disappears eastwards. East of the Kochel See the Flysch sandstone zone pushes north by 10 km. finally to disappear eastwards near the Chiem See. The limestone zone, that stretches right to the schist zone to the south, is reduced eastwards near the Chiem See by the northward extension of foreign structural elements from the south.

The rocks and their folds are varyingly affected by the forces of erosion. More noticeable than in the Swiss Alps are the evidences of a preceding peneplain level. These levels are well preserved on the limestone plateaus in the eastern section. More recent uplift and renewals of the cycle of erosion have accentuated the differences in the lithological character of the rocks and dissected the old surfaces. The uplift has, however, been uneven, so that the Aarberg Pass is an area of strong uplift, whereas the longitudinal valleys and the transverse gorge of the Inn at Kufstein and the area of the Seefeld saddle are areas of lesser uplift.

The outer edge of the Bavarian Alps has much the same rainfall as northern Switzerland. The high ridges have a rainfall exceeding two metres. Only in the longitudinal valleys of the Inn do dry areas occur, as in the Graubünden and Wallis of Switzerland. There is a low snow line (1,300–1,100 m.) and local glaciation occurred in the Allgäu, Schliersee and Chiemgau Alps. Valley glaciers occupied the small valleys but great valley glaciers extending from the Central Alps filled the longitudinal troughs and spread outwards across the low passes. Little ice reached the foreland in the first two ice phases, but in the later Riss period the valley glaciers spread over the low passes to merge with those of the Isar and Lech. On the limestone ridges there are series of cirques and greatly over-deepened U-shaped valleys. On the highest plateau levels there occur karstic features. Rock and screes often fill the valley floors, to the extent of a quarter of the whole area of the north Tyrol limestone Alps, and a third of the Salzburg High Alps. In the Allgäu the Flysch and Lias schists mountains are covered with woods and rich in water. They have frequent land slips and numerous small valleys make travel more difficult than on the limestone country.

The political frontier pays little attention to the detailed course of the watershed of the Inn and the northward-flowing valleys. It crosses highland blocks and the transverse valleys at valley narrowings. Indeed, it was at these valley constrictions that the frontier was first fixed, for the

valleys were the lines of Germanic penetration from the north and from the Inn valley to the south. In the highland between these valleys, the frontiers were never clearly defined. Even in the eighteenth century there were ill-defined and disputed stretches. A side valley on the Iller was settled from the Vorarlberg and it belongs politically to this area, though it lies in the German customs union. The upper Lechtal was settled from the north but it has easy connections with the south to the Tyrol through the Fernpass. East of the Inn the river Ache and the Saalach cross the whole limestone zone and bring north Tyrol into close contact with old Bavaria and Salzburg, but only that portion belongs to the Reich that gravitates northwards.

APPENDIX. GEOLOGICAL TABLES

Geological Sequence in Germany (after W. Schriel's Geological Map of Germany, published by the Prussian Geological Society, 1930, on a scale of 1 : 2,000,000.)

<i>Period</i>	<i>Rock Types</i>
Plutonic	Granite, gabbro
Flow Rocks and Tuffs	Old: Porphyry and dolerite Middle-aged: Porphyry with porphyrite, melaphyre Young: Liparite, trachyte, and some andesite, basalt
Crystalline Basement	Schist and gneiss
Pre-Cambrian	Algonkian: Phyllite, quartzite, greywacke, limestone
Cambrian	Slate and quartzite
Silurian	Sandstone, quartzite, limestone
Devonian	Lower: Quartzite, and slate in Rhineland, Westphalia, Hesse and Nassau Limestones and slate in Kellerwald, Lower Harz and Bohemia Middle: Limestone Upper: Limestone, marl and sandstone
Carboniferous	Lower: Culm and Carboniferous. Chert slate and greywacke Upper: Sandstone and shale, coal-bearing
Permian	Lower: Rotliegendes. Sandstone, shale and conglomerate Upper: Zechstein. Conglomerate, shale and magnesian limestone with beds of gypsum, anhydrite and salt, etc.
Trias	Bunter: Sandstone Muschelkalk: Limestone
Jurassic	Keuper: Sandstone and shale with gypsum Lower: Black (Lias). Shale, marl and limestone Middle: Brown (Dogger). Shale and sandstone in south Germany, shale in north Germany
Cretaceous	Lower (Cenomanian, Turonian, Emscher, Senonian, Danish): Sandstone, clay and conglomerate Upper: Limestone and marls with some sandstone
Tertiary	Old (Eocene, Oligocene): Clays and sands with some sandstones, and lignite. In the Alps the old Tertiary rocks are phyllites and sandstones Young: Miocene, Pliocene
Quaternary (Pleistocene)	Diluvium: Old Drift Deposits Young Drift Deposits Valley Deposits Peri-glacial Deposits (Loess)
Alluvium	

The Rocks of South Germany (after N. Krebs, *Der Südwesten: Landeskunde von Deutschland*, pp. 8-9)

<i>Period</i>	<i>Rock Type</i>	<i>Land Forms</i>	<i>Land Use</i>
Archean and Paleozoic	Gneiss, Granite Schists	Impervious. Varied resistance to erosion	Upland, forested with meadow, poor farmland
Permian	Rotliegendes: Conglomerates and Clays	Impervious	Spring lines. Cultivated land
Lower Trias	Bunter Sandstone	Pervious. Scarp-former	Forested, lacking in surface water. Late settled
Middle Trias	Muschelkalk	Pervious	Agricultural. Often stony heath. Early settled
Upper Trias	Lettenkohlen	Loamy, easily eroded. Plain	Cornland
	Gipskeuper	Clay. Rich in water	Orchards and vineyards
	Upper Keuper	Mainly pervious sandstones and scarp-formers	Much forest. Poor soils
Lias and Dogger (Black and Brown Jura)	Mainly clay with limestones and sandstones in Middle Dogger	Rich in water, differential erosion, hard Dogger beds forming a scarp	Horticulture and orchards, fertile. Liable to landslips
Malm (White Jura)	Resistant limestones and Dolomites	Pervious, resistant, scarp former	Scarp slopes forested with heath and poor cultivation on the plateau
Cretaceous (Kreide)	Mainly sandstones and clays	Partly pervious	Much forest
Oligocene in Upper Rhine and Miocene in the Alpine Foreland	Conglomerates, sandstones, sands, clays. Basalts and phonoloth eruptives	Varied resistance. Eruptives resistant. Differential erosion	Fertile, open landscape
Pliocene and Diluvium	Gravels, sands. Moraines. Loess	Easily eroded, pervious, except moraines and clays	Often well drained, fertile and closely settled
Alluvium	River deposits	Water table near surface	Fertile, when not waterlogged:

<i>Period</i>	<i>Physical Evolution</i>
Cambrian } Silurian } Devonian }	Marine sediments. Pre-Variscan folding.
Lower Carboniferous to Upper New Red Sandstone (<i>Rotliegendes</i>)	Six phases of Variscan mountain folding Deposits on northern border and in interior basins of the Saar Post-Kulm granitic intrusions and New Red porphyries Peneplanation (Permian)
Permian (<i>Zechstein</i>)	Marine Transgression. Formation of salts
Triassic and Jurassic	Orogenetic stability Epeirogenetic depression in Hesse and Thuringia (sedimentation) and uplift in the Rhine Massif.
Brown Jurassic	First appearance of the Lower Saxony coastline between the North German basin and the Central German land mass.
Kimmeridge } Portlandian } Wealden }	First phase of the Saxonian folding in the Teutoburger Wald.
Cenomanian	Southerly transgression of the Cretaceous sea.
Emscher. Lower Senonian	Subhercynian phase of the Saxon folding.
Upper Senonian	Uplift of the old massifs.
End of Mesozoic to Lower Tertiary	Formation of the pre-Eocene peneplain. Lignite deposits.
Middle Oligocene	Rupelton sea transgression.
Upper Oligocene	Savian phase of the Saxonian folding.
Lower Miocene	Styrian phase of the Saxonian folding.
Upper Miocene	Faulting of the Leine trough.
Old Pliocene	Young Tertiary peneplain with various peneplain levels and scarps. Beginning of present-day development of land forms (high terrace gravels)
Young Pliocene } Old Diluvium }	Strong orogenetic movements. Uplifts in the <i>Schwelle</i> and subsidence in the <i>Tiefland</i> .
Diluvium	(a) <i>Flachland</i> —glaciation of the Elster and Saale phases. Peri-glacial forms. Loess formation and valley formation in the latest Vistula phase. (b) <i>Gebirgsschwelle</i> —river erosion and formation of terraces. Erosion of depressions and accentuation of scarps and faults, etc. Vulcanicity (<i>Maare</i>) in the Eifel.
Alluvium	Present valley floors. Marsh and coastal features.

CHAPTER 3

CLIMATE, SOILS AND VEGETATION

GENERAL

THE GERMAN lands occupy the central part of the great Deciduous Forest Belt. This belt, like the climates with which it is associated, is found south of the Coniferous Forest Belt, that is to say, south of latitude 60 degrees. The Deciduous Forest Belt merges to the south on the southern slopes of the Alps into the drought-resistant, evergreen shrub vegetation of the Mediterranean lands, and to the southeast on the periphery of the eastern Alps into the grasslands or steppes of the Danube lowland. A steppe flora and open parkland were dominant in the Danube lowlands and in the eastern part of the Carpathian Foreland at the dawn of the Christian era, and remnants of such a steppe flora have been preserved since the Ice Age on warm and dry soils in the sheltered lowlands of the Central Uplands.

The character of the vegetation cover throughout the Deciduous Forest Belt so defined has been profoundly transformed by man through the destruction of the forest and the changing sequence of his crops and methods of cultivation. The whole area is today one of forest, meadow and small grain crops. As opposed to the parched, dry Mediterranean lands to the south, it is a land of summer moisture and green. But western Europe, central Europe and central Russia each have broad and markedly contrasted features of vegetation and climate.

Central Europe as a whole is clearly limited to the north, roughly along latitude 60°, by lands with a cover of coniferous forest in which the winters are too long and cold and the summers too short and cool for the cultivation of crops. It is limited to the south by the lands with moist mild winters and hot dry summers. To the east, in the trunk of Europe, between the Baltic and the Black Seas, winters become more severe and longer. Precipitation is markedly concentrated in summer, but there is also winter precipitation falling as snow with a long period of snow cover. A definitely maritime climate prevails on the coasts of northwestern Europe, but eastward, through central Europe, continental conditions gradually become more marked. These continental conditions, that are fully developed in central Russia, are associated in particular with the growth of the oak tree, whereas the milder climate associated with oceanic influences has the beech as its characteristic tree. The extreme "oak-climate", however, extends westwards into central

Europe to include the whole of the Carpathians south as far as the Danube as well as the highlands that encircle the Bohemian Massif and the Harz Mountains. The rest of central and western Europe has a "beech-climate", since it experiences mild and moist winters and warm and moist summers, features that become more pronounced westwards as the seas are approached. In central Europe, the oak climate (Dfb according to the Köppen classification of world climates) merges into the beech climate (Cfb) in a zone through Magdeburg, the Rhön and Milan. In the highlands east of this zone, the oak climate lies above the beech climate; but west of this zone, owing to milder temperatures, the oak belt disappears and the beech climate passes directly in higher altitudes into the so-called birch climate (Dfc), with less than four months with an average temperature above 10°C .

Within this general framework, we may now consider Germany and its neighbours in more detail.

CLIMATE

Temperature and rainfall are the two main constituents of climate and their variations from season to season are the product primarily of location and altitude.

Temperature. With regard to temperature conditions, we must first note the effects of oceanic and continental conditions. Oceanic influences on temperatures are most effective in winter. The actual mean monthly isotherm of 0°C . or 32°F . for January cuts right through Germany from Denmark southwards. The mean monthly temperature in the hottest month of July is highest in the continental areas in the lowlands in southern and southeastern Germany. That oceanic influences predominate in west and northwest Germany more strongly than in the south and east is shown by the range of temperature. Münster has a temperature range of 16.5°C ., Magdeburg 18.6°C ., Grünberg in Silesia 19.6°C . and Munich 19.8°C . The winter temperatures in southern Germany are markedly colder than in the Northern Lowland owing both to its greater remoteness from the sea and to its higher altitudes. The temperature regimes month by month for typical stations are given in the table on p. 64.

The length and warmth of the growing season is one of the most important facts of temperature in relations to human activity, especially to agriculture. This is revealed by the date of the blossoming of the apple tree and also by the date of the harvest of winter-sown rye. (Figs. 6 and 7.) The time of the flowering of woody plants may be taken as the onset of spring. This is earliest, April 22–28, in the Rhine valley from Basel to Cologne, and in its tributary Neckar and Main

valleys and the Moselle. Spring begins a week or so later (April 29–May 5) in the chief valleys of the Central Uplands and in the Danube valley below Regensburg, and throughout the whole of France and the Low

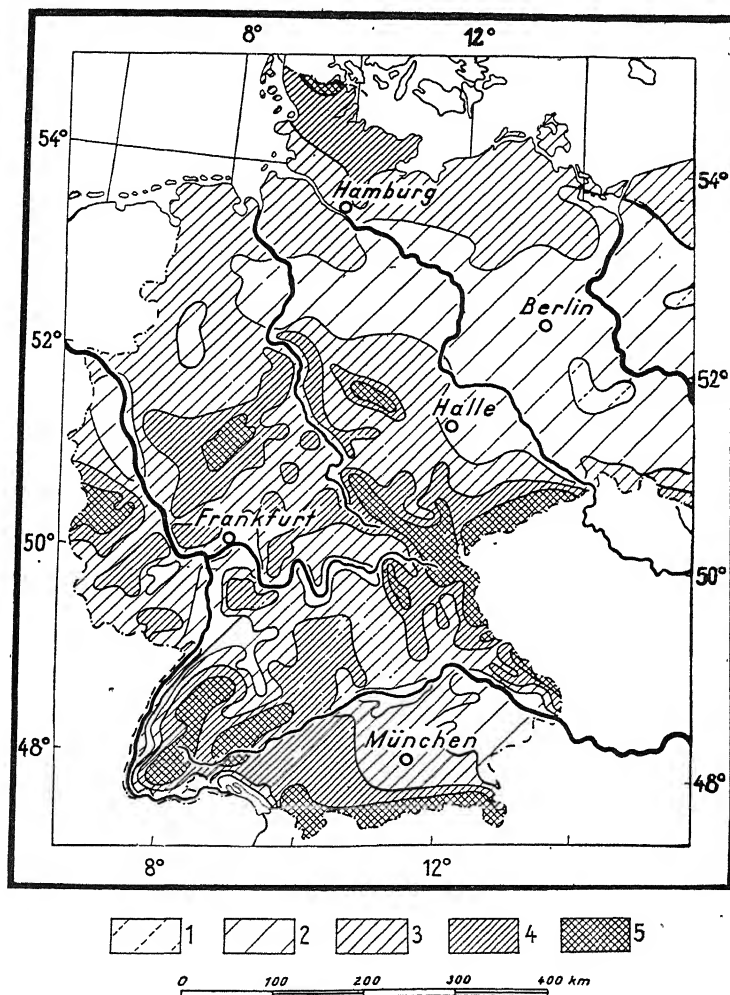


FIG. 6—GERMANY: BEGINNING OF APPLE BLOSSOM (1936)
(from *Amt für Landeskunde*) (scale, 1 : 12 m.)

1. Before 30 April
2. 30 April–9 May

3. 10 May–19 May
4. After 19 May

Countries and most of the Danube Lowland to the east. It is later, from May 6 to 12, in the west of Germany. The mean annual number of days with frost is also an important climatic fact of vital importance to human activity. This period is longest, over 120 days, in the extreme south of

Germany, in the Black Forest and Vosges and the Bavarian Plateau; while most of south Germany, the east of Brandenburg, Pomerania, and Silesia have 100–120 days of frost. On the other hand, less than 60 days

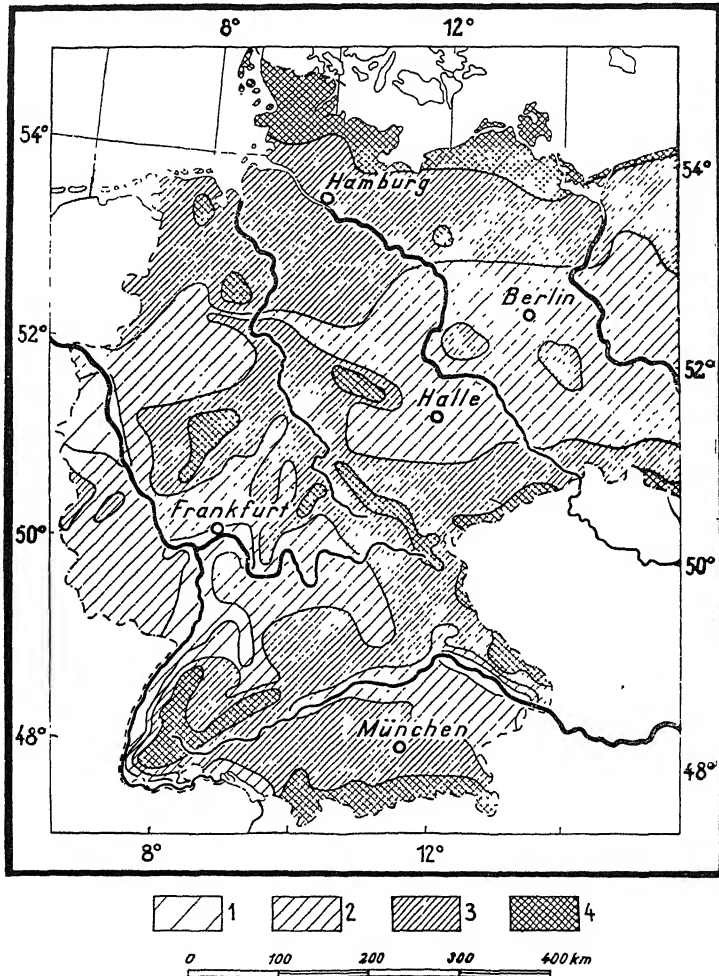


FIG. 7—GERMANY: BEGINNING OF THE WINTER RYE HARVEST (1936)
(from *Amt für Landeskunde*) (scale, 1 : 12 m.)

- | | |
|--------------------|---------------------|
| 1. Before July 9 | 4. 29 July–7 August |
| 2. 9 July–18 July | 5. After 7 August |
| 3. 19 July–28 July | |

of frost are recorded in the northwest, the Rhine valley and the lowland on the northern edge of the Central Uplands.

Rainfall. The distribution of the annual rainfall is shown on Figs.

8 and 9 for the whole of Germany. These maps reveal the very marked effects of altitude, and of western (oceanic) and eastern or interior (continental) conditions. The Northern Lowland, west of the Harz, Thuringian Highland and Mecklenburg, has a rainfall of 600–800 mm. per year, while the whole of the eastern portion, continuing right through Poland, has a smaller total of 500–600 mm. Autumn and winter in the northwest

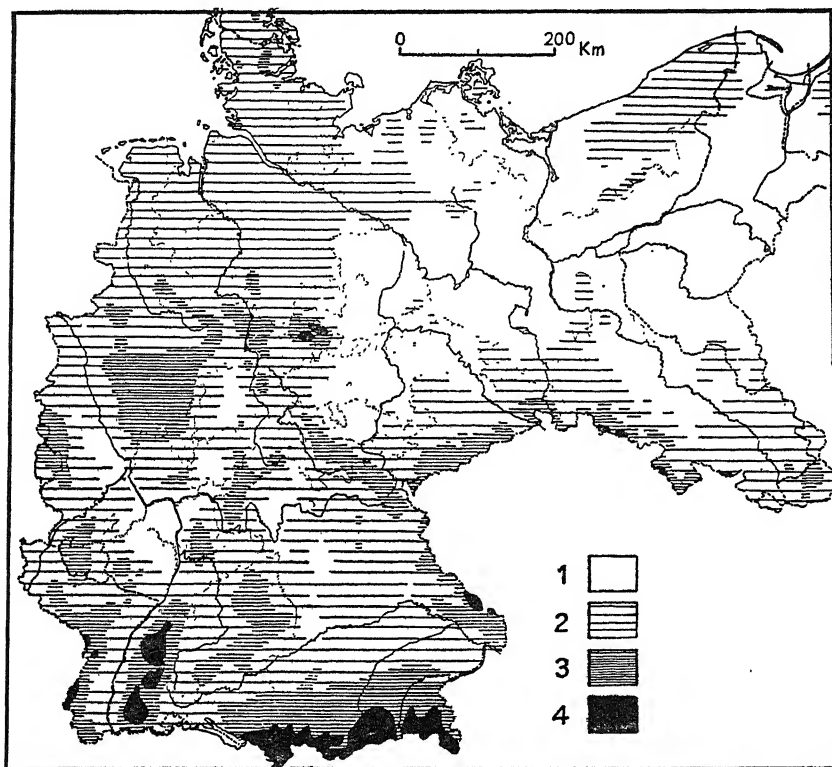


FIG. 8—GERMANY: MEAN ANNUAL RAINFALL (*from Hellmann*) (scale, 1 : 10 m.)

1. Up to 600 mm.
2. 600–800 mm.

3. 800–1400 mm.
4. Over 1400 mm.

is mild and wet, and skies are often overcast, whereas in the east there are long periods of hard frost, the air is crisp and dry, and there is more sunshine. The wetter and more overcast conditions in the northwest during the winter months are due to the deep spread of oceanic influences from the west, whereas eastwards continental conditions become more pronounced. In the Central Uplands, the highest rainfalls of 800–1,500 mm. and over are recorded in the main highland massifs. The areas of medium altitude have an annual rainfall of about 600–800 mm. The driest areas

with only 500–600 mm. and even under 500 mm. lie in a few areas that are all located in the low-lying and sheltered lowlands and basins. In western Germany these are the great Upper Rhine Plain (especially in the northern end), the middle basin of the Main river, centred on Würzburg, the uplands that flank the Rhine gorge below Bingen, the lowland of the Cologne Bay, below Cologne, and the Hesse lowland centred on Kassel. Other areas that are not quite so dry are found in the Danube valley in Bavaria and in the Naab lowland north of Regensburg.

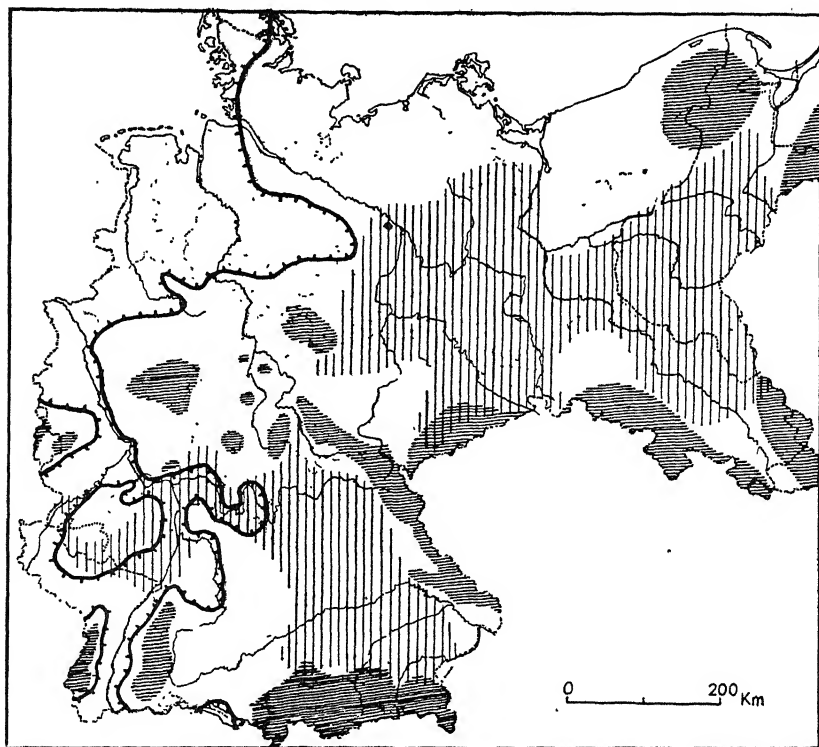


FIG. 9—GERMANY: SNOWFALL AND HUMIDITY (*from Hellmann*)
(scale, 1 : 10 m.)

Horizontal lines are areas with at least 50 days of snow per year. Vertical lines are areas with a relative humidity of 72% and less in the months of June, July and August. The black barbed lines enclose areas with a maximum of 30 days of snow.

Increasing distance from the sea results in a decreasing total rainfall in the Northern Lowland from west to east, so that one passes from the areas with pastoral farming, based on meadows and fodder crops, to the great arable areas of east Germany and Poland, from the realm of deciduous woods in the west to the realm of coniferous woods in the east. The coastlands of the Baltic are relatively moist since the contrast be-

tween land and water favours rains in late summer. The small water-bodies of the Belt and the Sund at the southern end of the Baltic Sea do not appreciably affect the rainfall, so that with increasing distance from the North Sea the annual total decreases. Cyclonic frontal rains appear, especially in Schleswig-Holstein, while rains in the rear of cyclones bring lesser rains to Denmark and Jutland. Thus, meadow and heath on the Jutland peninsula stand in marked contrast to the barley-growing arable lands on both sides of the Fehmarn Belt. Orography too affects the rainfall in northern Germany. The dry areas in the great valleys stand in contrast to the areas of slightly heavier rain on the morainic platforms. Soil and climate here account for the deciduous and spruce woods, while the dry sandy areas in the lee of the uplands have pine forests. Meadows and oats are more important on the higher land, while in the dry areas rye and wheat, sugar-beet and tobacco flourish. Small areas with rainfall less than 500 mm. occur in Pomerania and Brandenburg, but in Poland they cover a much larger area.

The Central Uplands have marked contrasts between upland and lowland. But distance from the sea is also apparent as an influence. The Ardennes, Eifel and Sauerland, 600–800 m. above sea-level, have the same rainfall as the Sudetes and Carpathians at 1,600–2,000 m. The rainfall of the Vosges and Black Forest exceeds the rainfall of the Böhmerwald and the Slovakian uplands at the same altitude. The precipitation of the lowlands and valleys depends on both their relief and the degree of exposure to the Atlantic. In Alsace and in the Rhine lowland of Hesse the driest areas have less than 500 mm. as in northern Bohemia and southern Moravia, and around these islands are areas with 500–600 mm. which include the district of Düren and the Maifeld in the Rhine Massif, Kurhessen and the Wetterau, Lower Franconia, the Nuremberg basin and the Egerland. The dry conditions of eastern Germany penetrate to Thuringia and Silesia, where distance from the sea and protection by encircling uplands result in a rainfall of under 500 mm. All these areas have high agricultural importance, based on barley and wheat, sugar-beet and the vine, merging in the south into areas of maize cultivation. The mountains, however, carry spruce and fir forests. They form the sources of the numerous rivers and streams of central Germany that are used for drinking purposes as well as for industry and, in some cases, for the irrigation of river meadows.

The Alps have the heaviest rainfalls. The mountains have a rainfall over 3,000 mm. but the valleys between the ranges have a small rainfall as in Valais, Oberinntal, Vintschgau, and the Dora Baltea where even irrigation is essential for cultivation. The southern Alps of the Oetzthal and Stubai, protected by the northern and southern limestone Alps, as well as the uplands behind Genoa and the head of the Adriatic, have

totals on their summits of only 1,600–2,000 mm. Totals decrease eastwards with altitude and in the areas of the eastern borderland of the Alps and in southern Styria and Slavonia the rainfall is only about 800 mm. This total is scarcely sufficient for agriculture (owing to the increased evaporation), whereas 600 mm. in the north is adequate for crop production. The Hungarian plain is dry, with less than 500 mm. in the Theiss valley. Rains are here heavier in the spring, when there are storms. A good deal of the rain is brought from the west by warm subtropical-continental air masses passing over cooler air masses. On this rain depend the staple crops of wheat and maize, that ripen well with the hot dry summer. The vine too grows in certain areas in this lowland. Rainfall occurs at all seasons with a marked summer maximum in June, July and August. Especially remarkable, as revealed in the table on p 65., is the late maximum (Sept.–Oct.) in the southern Tyrol and in the foreland of the eastern Alps, traits which are due to cyclonic disturbances that come from the Mediterranean basin. There are, in general, throughout west-central Europe two seasons of minimum rainfall, one in spring (April), that is an oceanic feature, and is found in the northwestern lowland, and the other in winter (Jan.–Feb.), that is characteristic of the continental conditions of the interior.

The period and depth of the snow cover during the winter months is of major significance to human activity. The snow cover is more a function of temperature than of precipitation. It decreases towards the oceanic northwest and increases toward the continental east and increases also in general with altitude. Thus, in Heligoland the snow cover lasts on the average for only 9 days, whereas in east Prussia, where continental influences are more marked, it lasts for 100 days. In Holland, as in the valleys of the Rhine and its tributaries, the snow cover lasts for under 20 days, and in the northwest generally and the Northern Lowland for 20 to 40 days. East of the Oder, however, the increasingly cold winters are reflected in a period of snow cover that lasts from 40 to 110 days. In general, in the heights of the Central Uplands, the snow cover lasts from 100 to 150 days. In the Feldberg in the Black Forest (1,493 m.) it lasts for 170 days, in the Erzgebirge at 1,215 m. for 175 days, and in the Schneekoppe in the Taunus (1,603 m.) for 206 days.

River Regimes. Another effect of climate on the surface of the land that affects human activity is the regime of the rivers and the periods during which they are frozen or obstructed by ice. High water on most of the rivers in Germany is in February and March, since they are fed by the melting snows and winter precipitation of the Central Uplands. Alpine waters, reaching their highest with the melting of snow and glaciers in late spring, feed the upper Rhine and the right-bank tributaries of the Danube. The Rhine has an Alpine regime at Basel and

the summer maximum is felt a long way down its course. The Danube has also an Alpine regime as far as Vienna. A March maximum is characteristic of the Ems, Weser, Elbe, Oder and Vistula. Ice cover on the rivers, when they are closed to navigation by ice, lasts 21 days on the Rhine at Cologne, 27 on the Ems, 37 on the Weser, 47 on the Elbe (at Magdeburg), 36 on the Oder, 93 on the Vistula, 102 on the Memel, and 27 on the Danube at Regensburg.

Navigation is rarely held up by ice on the shores of the North Sea, though severe spells, spreading over a few days, may come in from the east. Eastwards, on the Baltic shores, conditions are more severe, owing to greater exposure to continental conditions. Ice blocks the harbour at Wismar for 13 days, and at Stralsund for 27 days. Further east, ice begins to form in shallow water in early December, becomes continuous in January, and lasts until early March.

Volume, rate of flow, depth and period of freezing are all of great importance in considering the use of a river to man. The Rhine may be chosen by way of more detailed illustration.

The Rhine down to Basel is an Alpine river. Its waters are abundant, and at their lowest in winter. Below Lake Constance the river cuts through the limestone rocks of the Jura in rapids near Schaffhausen. The bulk of its Swiss tributaries like itself are fed by Alpine snows and glaciers and add to its summer high-level. At Basel the maximum flow is in July, although the low-level of winter, that is characteristic of the Alpine-fed river, is raised by water received from streams that rise in the Jura. Below Basel, the Rhine flows over a gravel-filled flood plain some two to three kilometres wide. Now all the tributaries rise in the adjacent uplands and are fed by winter precipitation and the early melting of the snows. These rivers are in consequence at their highest in spring and at their lowest in summer. Floods occur during the winter months. Yet in the Rhine gorge the river still shows evidences in its behaviour of its Alpine origin in the high summer level of its flow in June and July, whereas the second maximum due to waters derived from the Central Uplands is in the winter months. The Moselle, for example, has a marked maximum in the winter half-year and a marked and steady maximum in the summer half-year. On entering the northern plain, the June-July maximum is still evident, but the winter maximum from December to March is the chief maximum.

Regional Variations. We may conclude by briefly characterizing the regional variations of climate in the German lands. (Fig. 10.) These are the product primarily of the seasonal variations of temperature and rainfall, and these in turn depend on location and altitude. For this reason, the Northern Lowland shows gradual changes in its climatic characteristics, but contrasts are more varied and marked in the areas of greater

variety of relief in the Central Uplands. The main provinces into which Germany may be divided from the standpoint of temperature and rainfall regimes, with typical stations, are shown in the table below. The characteristics of the climatic provinces are as follows (see Fig. 10):

(1) The Northwest Province, with its southern boundary stretching roughly from Aachen to the island of Rügen on the Baltic shores, has mild winters, cool summers, a medium rainfall, heavy cloudiness and high humidity (e.g. Bremen).

(2) The East Baltic Province shares the oceanic characteristics of No. 1 but differs from it in its colder and more continental winters and in its smaller rainfall (e.g. Königsberg).

(3) The Eastern Lowland Province lies east of the Harz and the Thuringian Highland, with its heart in the middle Elbe basin. It has warm summers, cold winters, with greater extremes as one goes inland and eastwards, a small rainfall (the smallest in Germany), low humidity, and a small cloud cover (e.g. Berlin).

(4) The Central Uplands Province extends south to the Alps so as to include the Bavarian Plateau. It is a zone of transition between the moist and mild climate of the maritime west, and the moist climate with cold winters and snow precipitation, and a rainfall maximum in the summer half-year, in eastern Europe. This eastern climate, that dominates central Russia beyond the waist of Europe between the Baltic and the Black Seas, penetrates into the Central Uplands in its highland areas and becomes less marked westwards. This is the "oak-climate". There are, however, marked contrasts between the lowlands (e.g. Bayreuth), that are drier and warmer with longer growing seasons, and the highlands (e.g. Freudenstadt), that are wetter and colder with shorter growing seasons. The temperature range in both lowland and highland becomes greater, and the incidence of summer rain becomes more pronounced, as one passes from the northwestern sector in the Rhine Massif to the southeast. The Bavarian Plateau (e.g. Munich) shows distinctive features due to its altitude and continental location. Its winters are colder and the precipitation heavier than at places of similar altitude in the Central Uplands.

(5) The Rhine, Moselle, Main and Neckar valleys have dry and relatively mild winters, an early spring, and a long hot summer (e.g. Freiburg-in-Breisgau).

(6) The Bavarian Alps and the northern Prealps in general receive a heavier total precipitation than the Bavarian Plateaus over a third of which falls in the months of June, July and August (e.g. Traunstein). In the southern Tyrol and the eastern Alps the season of maximum rainfall comes later, from September to November.

APPENDIX. CLIMATIC TABLES

Germany: Mean Monthly Temperatures and Range of Temperatures (from E. Alt, *Klimakunde Von Mittel-und Südeuropa* in W. Köppen and R. Geiger, *Handbuch der Klimatologie*, Teil M. Band III).

<i>Province</i>	<i>Station</i>	<i>Ht. in Metres</i>	<i>Jan.</i>	<i>Feb.</i>	<i>Mar.</i>	<i>Apr.</i>	<i>May</i>	<i>June</i>
1. Northwest	Bremen	40	0·9	1·5	3·4	7·8	12·3	15·7
	Münster	60	0·3	1·5	5·7	7·6	12·4	15·6
2. East Baltic	Königsberg	5	-2·9	-2·7	-0·2	5·5	10·7	15·4
3. East Lowland	Berlin	50	-0·4	0·3	2·8	7·7	12·7	16·7
	Magdeburg	58	-0·4	0·8	3·7	8·2	13·5	17·0
	Warsaw	120	-3·4	-2·8	0·5	7·1	12·8	17·3
4. Central Low- Lands	Bayreuth	360	-2·2	-0·9	2·4	7·2	11·6	15·5
Central Up- lands	Freudenstadt	730	-1·9	-1·0	1·7	5·8	10·2	13·9
	Munich	525	-2·1	-0·2	3·2	7·7	12·5	15·9
5. Rhinelands	Freiburg-i-B.	125	0·5	2·1	5·1	9·7	13·6	17·4
6. Alpine	Innsbruck	600	-3·3	-0·6	3·7	8·8	12·9	16·2
	Traunstein	597	-3·7	-1·5	1·8	6·4	11·3	14·7
5. Danubian	Vienna	200	-1·7	0·2	3·9	9·4	14·0	17·7

<i>Station</i>	<i>July</i>	<i>Aug.</i>	<i>Sept.</i>	<i>Oct.</i>	<i>Nov.</i>	<i>Dec.</i>	<i>Mean</i>	<i>Range</i>
Bremen ..	17·3	16·5	13·6	9·1	4·1	1·7	8·6	16·4
Münster ..	16·8	15·9	13·1	8·7	4·6	1·4	8·4	16·5
Königsberg ..	17·3	16·6	13·1	7·6	1·8	1·9	6·7	20·2
Berlin ..	18·1	17·4	13·9	9·0	3·4	0·4	8·5	18·5
Magdeburg ..	18·2	17·3	14·1	9·1	4·0	1·0	8·9	18·6
Warsaw ..	18·8	17·6	13·4	7·8	1·6	-2·6	7·3	22·2
Bayreuth ..	17·0	16·3	12·7	7·6	2·0	-1·7	7·3	19·2
Freudenstadt	15·5	14·9	11·8	6·9	2·6	-0·8	6·6	17·4
Munich ..	17·7	10·9	13·3	8·1	2·9	-0·7	7·9	19·8
Freiburg-i-B.	19·2	18·6	15·1	10·0	5·4	1·7	10·0	18·9
Innsbruck ..	17·8	16·9	13·9	8·8	2·7	-2·6	7·9	21·1
Traunstein ..	16·4	15·5	12·1	6·9	2·0	-1·8	6·7	20·1
Vienna ..	19·6	18·8	15·2	9·8	3·5	-0·6	9·2	21·3

Germany: Average Monthly Rainfall as Percentage of Total Annual Rainfall determined as an average of a number of stations in each climatic province (from O. Maull, Deutschland, p. 28)

Province	No. of Stations	J.	F.	M.	A.	M.	J.	Jy.	A.	S.	O.	N.	D.
1. Northwest													
Dutch-German North Sea Coast ..	35	7	6	7	6	8	9	10	11	10	9	9	8
N.W. Germany (Hanover, Oldenburg, Westphalia, Niederrhein, except coast) ..	19	7	7	7	7	8	10	11	10	8	8	8	9
2. East Baltic Lands (Mecklenburg, Pomerania, E. Prussia) ..	22	6	5	6	6	8	11	13	12	9	8	8	8
3. East Lowland (Brandenburg, Posen, Silesia) ..	23	6	6	6	7	9	12	13	12	8	7	7	7
4. Central (Rest of Rhine Province Hessen, Thuringia, Land & Prov. Saxony) ..	69	6	6	7	7	9	11	12	11	7	8	8	8
5. Rhineland (Pfalz, Alsace, Württemberg, Baden, Bavaria) ..	63	6	6	7	7	10	11	11	11	8	8	8	7
6. Alpine													
(a) N. Tyrol, Voralberg ..	5	5	4	7	8	9	12	13	12	9	7	7	7
(b) Salzburg, Austria, Upper Styria ..	19	5	5	7	7	10	12	13	13	9	6	7	6
(c) S. Tyrol ..	12	4	4	6	9	11	10	9	9	11	12	9	6
(d) S.E. Carinthia, Carniola ..	16	6	5	7	7	9	9	9	9	10	11	10	8

Germany: Mean Monthly Rainfall (in millimetres) (from E. Alt, Klimakunde von Mittel- und Südeuropa)

Province	Station	J.	F.	M.	A.	M.	J.	Jy.
1. Northwest	Bremen ..	48	44	49	41	57	65	88
	Münster ..	57	49	60	43	53	70	89
2. East Baltic	Königsberg ..	42	38	37	38	48	62	83
3. East Lowland	Berlin ..	37	35	43	49	52	75	54
	Magdeburg ..	29	31	38	31	45	51	67
	Warsaw ..	33	28	32	41	49	64	77
4. Central Uplands	Bayreuth ..	37	33	39	32	54	63	67
	Freudenstadt ..	125	126	139	99	105	123	126
	Munich ..	39	34	46	71	91	121	115
5. Rhinelands	Freiburg ..	42	47	57	63	79	103	104
6. Alpine	Innsbruck ..	39	42	49	58	69	101	127
	Traunstein ..	84	78	97	114	143	181	188
7. Danubian	Vienna ..	41	27	48	59	73	79	76

<i>Province</i>	<i>Station</i>	<i>A.</i>	<i>S.</i>	<i>O.</i>	<i>N.</i>	<i>D.</i>	<i>Total</i>
1. Northwest	Bremen ..	72	53	60	51	53	693
	Münster ..	77	59	63	59	68	760
2. East Baltic	Königsberg ..	85	76	60	58	56	695
3. East Lowland	Berlin ..	46	44	41	41	43	563
	Magdeburg ..	48	43	42	33	34	499
4. Central Uplands	Warsaw ..	62	42	31	37	35	541
	Bayreuth ..	64	48	42	42	45	575
	Freudenstadt ..	110	102	112	127	157	1,474
	Munich ..	99	94	57	44	45	870
5. Rhinelands	Freiburg ..	96	81	75	58	50	869
6. Alpine	Innsbruck ..	114	87	59	41	52	853
	Traunstein ..	167	150	96	85	96	1,502
7. Danubian	Vienna ..	63	43	54	35	41	651

Germany: Number of Days with Snowfall (from E. Alt, *Klimakunde von Mittel- und Südeuropa*)

Flensburg	28·7	Schneekoppel	29·4
Lauenburg	54·6	Leipzig	32·5
Putbus	39·8	Dresden	32·0
Helgoland	24·8	Erfurt	38·8
Hamburg	36·6	Marburg	35·5
Stettin	34·6	Aachen	28·2
Neu Strelitz	39·2	Bayreuth	47·0
Bremen	28·8	Wurzburg	28·5
Berlin	35·1	Frankfurt	25·5
Hannover	26·6	Trier	23·5
Magdeburg	37·4	Nurnberg	39·4
Munster	28·1	Regensburg	35·2
Grunberg	42·8	Passau	37·0
Klausthal	70·0	Freudenstadt	52·1
Brocken	98·6	Munchen	53·1
Kassel	36·6	Freiburg	24·3
Breslau	48·2	Traunstein	54·3
Ratibor	48·5	Friedrichshafen	27·1
		Zugspitze	181·0

Germany: River Regimes (from O. Maull, *Deutschland*, p. 544)

<i>Drainage Basin</i>	<i>Rainfall %</i>		<i>Flow %</i>		<i>Evaporation %</i>	
	<i>Winter</i>	<i>Summer</i>	<i>Winter</i>	<i>Summer</i>	<i>Winter</i>	<i>Summer</i>
Memel	37	63	25	9	12	54
Vistula	35	65	17	8	18	57
Oder, Elbe	38	62	18	8	20	54
Weser, Ems	43	57	24	11	19	46
Rhine	44	56	29	23	15	33
Danube	40	60	24	29	16	31
N. Central Europe	37	63	19	9	18	54
Alpine Rivers	42	58	26	26	16	32
Central Europe	39	67	22	15	17	46

SOILS

Soil development is determined in large measure by conditions of temperature and moisture, so that soil types show a close relation to climate in their wider distributions. But the detailed characteristics of soils are due to the underlying characteristics of the bed-rock, the drainage conditions, and the minute differences of slope. In consequence, there is a very close relationship between the surface of the land and the soil that develops on it. Since there is great diversity in the detail of the land surfaces in western Europe, and in western Germany in particular, so there are minute variations in the character of the soil and, moreover, in the initial kind of vegetation that it supported, and in the subsequent use to which agricultural man has been able to make of the soil. We shall here confine ourselves to a broad consideration of the character and distribution of soils in central Europe.

We may first notice certain characteristics of the main processes of soil formation and of soil types.

The word *Podsol* is of Russian origin and means ash-coloured. The process involved in the formation of such a soil is one whereby the percolation of water dissolves the soluble constituents near the surface and so plant growth is retarded through the lack of plant constituents. The extent to which the process goes on depends on the moisture and temperature conditions. Calcium carbonate is also dissolved out through the action of carbon dioxide in the water, in which earthworms cannot live, so that the dead plant matter, instead of being made into humus and mixed with the soil by these worms, remains on the surface as a rotting layer of acid humus. Below this layer, the soil, deprived of humus and iron and salts, becomes a greyish clay, while the dissolved constituents collect in the subsoil to form an iron pan, called in German *Ortstein*, that is impenetrable by plant roots. This threefold horizon is characteristic of the podsol soil and this is characteristic of the heaths and moors and forests of northern Germany.

A second large group of soils that covers much of Germany are the *Brown Forest Soils*. These soils have not been leached to nearly the same degree as the podsols and are in consequence much more fertile. Humus and iron remain and give to the soil its dark-brown colour. Such soils are characteristic of areas of deciduous forest vegetation. The forests have generally been cleared and the soils brought under cultivation. Podsolization is a further process in soil formation and some of the brown-forest soils of northern Germany are in process of becoming podsolized.

The third main group of soils are the *Chernozems*. These are fine-grained black soils and are typically developed in the steppes of south

Russia in Europe from whence they extend westwards through the Ukraine to Silesia and the middle Elbe basin. Downward solution takes place in the winter but upward movement through plant growth takes place in the dry, hot summer. The soil is rich in plant foods and calcium carbonate collects as a layer between the soil and the subsoil, while the humus gives the black colour to the soil.¹ The black soils are mainly derived from loessic deposits, but in Germany and in western Europe, such loess materials, that collected under the grassland vegetation that succeeded the withdrawal of the Ice Sheet, have been modified by milder and wetter conditions, so that there has been more leaching and the soils developed from the parent material have a yellow-brown colour. They are known in French as "limons" and are, in effect, "degraded" chernozems. Such soils occur over large areas in northern France, central Belgium, the Cologne Bay, and in many areas in the lowland pockets of central Germany.

Soils derived *in situ* from limestones are called *Rendzinas*. They are thin in depth and dark red or brown or even black in colour. They contain calcium carbonate, and are dry, but if adequately watered are very fertile.

Peat soils are found under waterlogged conditions, when bacteria cannot function because of the absence of oxygen so that plant matter cannot be changed into humus.

The so-called "skeleton" soils are those which are thin and contain rock fragments. Their formation is prevented by the roughness of the relief on very hard rocks. A scree on a steep slope is an extreme case of a skeleton soil.

Soils are classified for west-central Europe as follows in the *Atlas des Deutschen Lebensraumes* on the basis of their genetic pedological characteristics. The main groups are based on the chief factor involved in their formation.

Vegetation

- (a) Brown and Black Steppe soils (*Chernozems*).
- (b) Steppe soil degraded through forest growth and surface leaching by water (*Degraded Chernozems*).
- (c) Brown Forest soils.
- (d) Leached Brown Forest soils.
- (e) Wet Forest soil.

Water

- (f) Partially Bog soils (*Anmoorige Böden*).

¹ Such soils of the sub-humid regions of the earth's surface have been described as pedacals, from the two chemical constituents, calcium and aluminium silicates, that make up their chief constituents, as opposed to the pedalfers of the humid lands in which aluminium and iron oxides are the main chemical constituents.

- (g) Bog soils (*Moor*).
- (h) Fen and raised Bog (*Flachmoor* and *Hochmoor*) soils.
- (i) Wet alder and meadow soils in valleys and depressions (*Auen-, Bruch- and Wiesenböden*).
- (j) Salt Marsh soils (*Seemarschböden*).

Parent Rock

- (k) Red soil on limestone (*terra rossa*).
- (l) Grey to black soil on limestones (*Rendzina*).
- (m) Coloured clay and loam soils.

Salt

- (n) Solonch.
- (o) Salt marsh, etc.

Slope. Immature soils on steep slopes.

We may now turn to the distribution of the main soil types in the west German lands. (Fig. 11.) Podsolized soils are predominant in the northern glaciated lowland, especially in the northwest, west of the Elbe. Here, water has removed the soluble plant foods such as iron and salt compounds, leaving a poverty-stricken grey soil that often rests on an impenetrable layer formed by the downward wash of material at the upper level. This is the iron pan, or *Ortstein* as it is called in German, that prevents both the extension of plant roots and drainage. Peat bog and heath cover large areas. The clays of the coastal marshes are fertile loam and clay soils. On the other hand, on the more recent glacial deposits east of the Elbe leaching has not gone so far and the soils are more productive. They fall into the category of Brown Forest Soils and are particularly well developed on the boulder clays of the Baltic Uplands in Holstein and Mecklenburg. The soils of the sands and gravels that lie in the giant valleys of Brandenburg are podsolized like those west of the Elbe. These are distinct from the alluviums of the river valleys.

There is much more variety of soils in the Central Uplands owing to the greater variety of geology and relief. Podsoles occur on sandstones and sands. Brown Forest soils are dominant on the Bavarian Plateau and in the middle Main and Neckar valleys. Along the northern border of the uplands and in scattered pockets in the uplands there are loess deposits, upon which chernozem soils have developed to form the best farm land. Rendzina soils are developed on the limestones, especially those of the Muschelkalk limestones. These are dry clay soils, with fragments of limestone. The areas of rough upland or highland relief lack developed soil profiles and the soils are described as "immature" and as "skeleton" soils. They are only a few inches deep and contain numerous stony fragments of the underlying rock.

What is of more significance to the geographer than the mode of

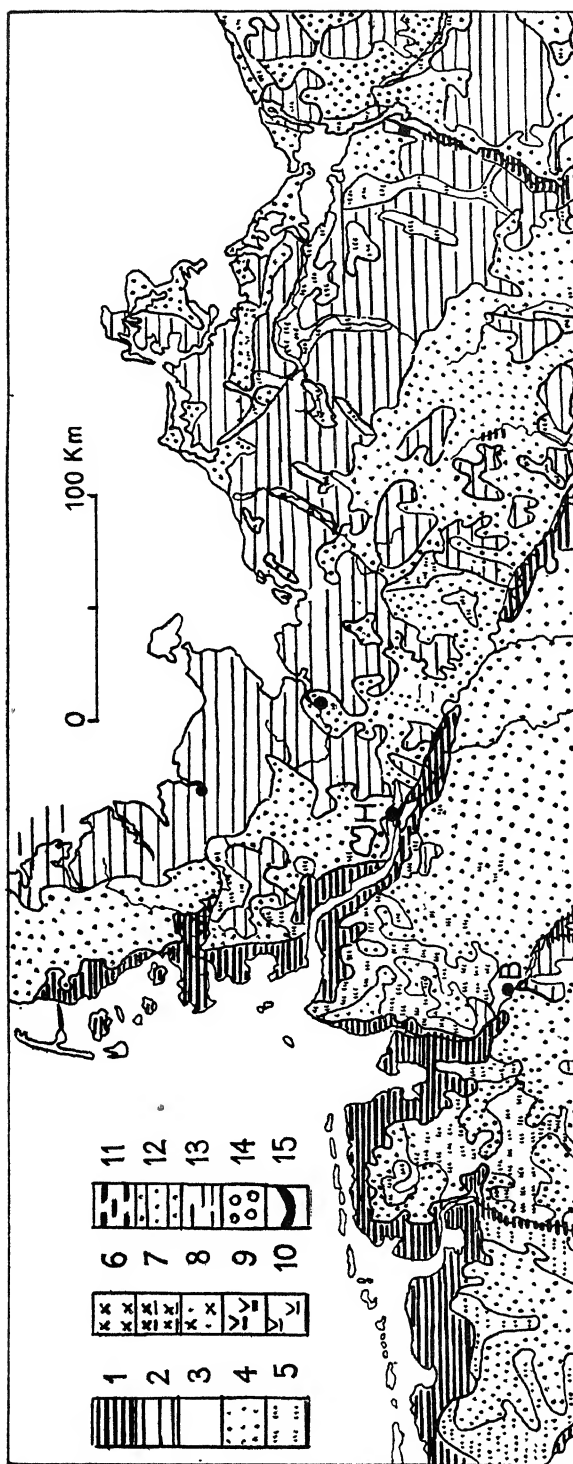




FIG. 11—GERMANY: SOILS (from A. d. D.L.) (scale 1 : 4 M.)

[For key see over

formation of soils is the character of the soil based on its physical contents. This is the basis of the classification used on Fig. 11, the details of which are as follows:

Clay.	
Loam.	
Loess-loam (<i>Staubsand</i>).	
Sand and gravel and dunes.	
Bog (<i>Flachmoor, Hochmoor</i>).	
Thin clay	} on solid impervious rock (<i>Gebirgsschutt</i>).
Thin loam	
Thin sand	
Thin clay	} on pervious limestone.
Thin loam	
Thin clay	
Thin loam	} on volcanic rock.
Bare rock (<i>Felsboden</i>).	

This method of classification of soils is of decisive importance to the geographer. To him what matters most about the land is its degree of relief and the lithological character of its rocks, in so far as they determine permeability (and thus the availability of water), and the character of the surface soil, and the type of vegetation and crops it will support. Detailed maps of this kind are of fundamental importance in assessing the characters of the landscapes of the earth's surface as well as of the types of rural economy and land uses associated with them.¹

One of the most important elements of the land that affects the mode of human adjustment to it is the bed-rock, since this determines not only the detail of slope, but also the texture of the soil and the availability of water. The geographer needs detailed maps of the rock according to its lithological character and the disposition and depth and permeability of the rock strata, rather than geological maps based on age and fossil content. Fig. 11 attempts to show the general lithology of the west German lands on the same map as the soil types.

NATURAL VEGETATION

At the beginning of the Christian era, before man had begun to clear the forest on a large scale, at least two-thirds of west-central Europe outside the mountains was either forested or marshy. The light, well-drained soils, such as lay on loess, limestones, sands and gravels, attracted human settlement as far back as the Neolithic era, and, by and large, these

¹ See H. Stremme, "Die Böden des Deutschen Reiches und der Freien Stadt Danzig", *Petermanns Mitteilungen, Ergänzungsheft* Nr. 226, 1936, with a soil map on the scale of 1:1,000,000. This map was enlarged to a scale of 1:250,000 and was the basis of the detailed studies of terrain in western Germany (Ch. 16).

were the initial areas of German settlement from 500 B.C. to A.D. 500.

Two points should be emphasized at the outset in dealing with "natural" vegetation. In this treatment, we are concerned with the "natural" vegetation in so far as its character can be reconstructed before man's great onslaught on it towards the end of the first millennium after the birth of Christ.¹ This is the period that is known to German scholars as the *Rodungszeit*. Since this time, man has cleared the forest or modified its character, drained the marsh, and used and changed the open woodlands and heaths of north Germany, so that the natural conditions of growth have been disturbed and the floral character changed. Woods, too, have been cleared. It is not suggested, however, that man did not affect the natural vegetation before this time; he certainly did, though it is not clear how and over what areas. It is claimed that from the standpoint of the land of today the main changes were wrought with the beginning of close and permanent agricultural settlement in western Europe.

Not only is man himself, however, an active agent of change. Plants migrate and associate with plants that like a similar habitat and they compete with each other in the formation of plant associations. They change also in accordance with changes of climate, and climatic pulsations since the Ice Age have been accompanied by changes in the distribution of individual species and in the character of the flora and the plant associations in the same area. We cannot pursue all these aspects of the problems of plant geography here, although only through this historical interpretation can the character of the natural vegetation and the changes wrought by human interference be properly understood.

The changing character of the surface vegetation is the result of both climatic changes and human interference. It is thus difficult in any area to decide just what "natural" vegetation means. Primitive man in the Neolithic Age already burned and felled trees so that woodland disappeared and its place was taken by heath. So-called "forest-free" lands at the dawn of our era were undoubtedly wooded in prehistoric times, and, indeed, it would appear that prehistoric pastoral communities

¹ This is the definition used by K. Hueck, the outstanding scholar in this field, in his work on plant geography in Germany and in his map of *Natürliche Vegetation* in the *Atlas des Deutschen Lebensraumes*.

Fig. 11. GERMANY: SOILS

- | | |
|---------------------------------|--|
| 1. Clay | 10. Thin loam on volcanic rock |
| 2. Loam | 11. Loams on limestone rock |
| 3. Loess-loam | 12. Mixed sands and loams |
| 4. Sand and gravel | 13. Limestone rock surface with no soil cover |
| 5. Bog soils (<i>moor</i>) | 14. Mainly limestone rock surface with no soil cover (<i>screes</i>) |
| 6. Thin clay on impervious rock | 15. Northern limit of the Alps |
| 7. Thin loam on impervious rock | |
| 8. Thin sand on impervious rock | |
| 9. Thin clay on volcanic rock | |

sought open, wooded land to pasture their cattle and pigs. But the great era of forest clearance commenced between A.D. 500 and A.D. 800.

The onset of the Ice Age resulted in the development of a tundra flora throughout the ice-free areas of central Europe. With the withdrawal of the ice, there came a cold, dry (Boreal) period, that was followed by a milder and moister (Atlantic) period, when oceanic conditions penetrated by the extension of the sea. The warmth-loving plants of the late Tertiary era were swept south by the advance of the Ice Sheet and some of this flora returned when the ice withdrew, while the Arctic plants retreated northwards or were relegated to, and preserved to this day in, the high mountains. During the cold, dry (continental) period that succeeded the end of the Ice Age (Boreal), a xerophytic steppe-heath flora penetrated westwards. With the subsequent onset of milder and moister period (oceanic) conditions, this steppe flora was gradually invaded by tree growth, and the former is preserved today on the dry and warm soils, on loess, limestone and gravel deposits. It was mainly on the well-drained loessic soils that Neolithic man settled. This mild and moist phase continues to our day.

The post-glacial periods, more especially in central Europe, began with a cold, dry, continental period with a tundra vegetation, at a time when the ice front had retreated to southern Sweden and southern Finland. As it became more mild a moist birch-tundra vegetation developed, then park steppe with the birch and the pine (*Pinus sylvestris*; German, *Kiefer*). This was the Boreal Period. More oceanic conditions, warm and moist, reached their optimum in the early Neolithic period of human settlement, when open oak woodland, mixed with elm, lime and oak, became very characteristic. This is the so-called Atlantic Period. Then came a long period in which temperature and precipitation again decreased, during the Neolithic, Bronze and Iron Ages, reaching the climatic conditions of the historical period. In this period beech and spruce (German, *Fichte*) spread as closed forest and open woodland, and even invaded parts of the steppe-heath areas that were thus reduced in extent. This was the condition at the beginning of the great age of forest clearance in the middle of the first millennium of this era. (See p. 80.)

The spread of Neolithic man took place in the Atlantic period during the optimum phase of forest growth, when the dry loess soils were at any rate partly wooded. The late Mesolithic food gatherers, fishers and hunters avoided the loess. Tardenoisian man was especially associated with sandstone and sandy soils that would be less wooded. Thus, concludes Alice Garnett, "General considerations seem therefore to suggest that the direction of geographical emphasis may have been fundamentally wrong in assuming that Neolithic man, unable to modify a forest environment to suit his needs, made use of more open country only".

Heath and steppe flora often exist probably as a result of man's early occupation of the land. And man cleared trees by burning and felling at an early date. This has been proved in Denmark for the Neolithic period when forest cutting and burning took place and trees were replaced by heath. The so-called "natural" heaths of central Jutland were originally areas of open oak forest cleared first by Neolithic man and at an increasing rate during the Iron Age. But that Neolithic man did show a preference for the loessic soils is undisputed and there are several clear reasons why this preference was shown, without necessarily claiming that these areas were all naturally free of trees. These soils were fertile, they were light and loamy and could easily be worked with the primitive wooden plough, and they are well drained and formed a suitable material for the cutting of pit-dwellings, and the even surfaces of loess-covered land could easily be cleared of trees by cutting or burning.

"From an original surmise that Neolithic man followed the distribution of natural forest clearings, a theory was developed that areas of presumed natural steppe-heath evolved during the phase of deteriorating, drier climate known as Sub-Boreal. Later researches in some cases dispute the existence of a pronounced or prolonged dry Sub-Boreal phase, and in any case, the advance of Danubian man in Europe is placed prior, and therefore unrelated to, such a climatic phase. Finally, quite recent research increasingly points to the somewhat startling possibility that the changes in the characteristic vegetation from forest to steppe-heath may be due to biotic rather than to climatic developments associated with processes of forest destruction carried out by primitive man himself." This is a recent statement by Miss Garnett that will be of service to English readers, as indicating, indeed, not a new interpretation, but a change in viewpoint from that of Robert Gradmann, the main exponent of the steppe-heath theory. This modified position, based largely on pollen-grain analysis, is now generally accepted by students of early man and geographers (see Chapter 6).

The extent of the woodlands and of open land at the eve of the *Rodungszeit*, say about A.D. 500, has been mapped on the basis of soils, flora, and place names and medieval records. The results are shown on Fig. 27. The German tribes occupied the open steppe and parkland areas that are left unshaded on this map. Some of these were "natural" forest-free clearings, others were open parkland in which the trees had been cleared. Probably 70 to 75 per cent of all Germany was forested at this time as compared with 27 per cent of today. This figure may be compared with 5 per cent in Great Britain today.

The question of the origin of heathland and coppice (*Niederwald*) is disputed. Heath is a characteristic oceanic formation in northwest Germany, where it includes heather and juniper. But it is probably a degenerate

formation, due to the destruction by man of initial open oak-birch woodlands, for these are among the earliest areas of prehistoric settlement. Great areas have been planted with conifers in more recent years. Forests have not only been cut down. They have also been used by man, and their character has thereby been changed. Woodland, as is still the practice in parts of the Rhine Massif, was cut down or burned to make way for temporary cultivation (*Hackwaldwirtschaft*) until recent times. The coppice (*Niederwald*) that grew in such areas was also exploited for oak bark for tannin. Such cutting or burning of the woodland is variously called *Hauberg-* or *Reutbergwirtschaft*.

Today woodland is still dominant in areas that are unsuitable for agriculture. (Fig. 31.) It covers areas of dissected relief, such as the Thüringerwald, Harz, Sudetes and Alps; pervious rocks in mountainous areas which have not been cleared for cultivation, especially notable in this connection being the Triassic sandstone plateaus such as the Spessart and Oldenwald, Pfälzerwald, Black Forest, the Elbe sandstone uplands; and the impervious soils on lowlands, or on the *Sandr* and valley sands of northern Germany and the Upper Rhine Plain. On the other hand, smooth surfaces of intermediate altitude have been greatly deforested as in the Eifel, Westerwald, Oberpfalz, southern Bohemia, and the Bavarian Plateau. Heavier clay soils were also cleared and brought under cultivation with the use of the plough as in the Keuper and Lias clays of Swabia and Franconia.

The natural vegetation as shown on Fig. 12 shows the following formations.¹ The term is used to designate the dominant types of vegetation that occur, or that would occur, had they not been affected by human interference.

1. *Beech Forest*. This grows best on well-drained moist soils with neither severe winters nor very hot summers and does not grow well with a short cool growing season. It is the dominant deciduous tree in central Europe and spreads up the hills to altitudes of 2,000 ft. in the Harz and 4,000 ft. in the Bavarian Alps where it is replaced by spruce. Beech forest on fairly acid soils occurs in the Baltic Uplands and western Germany. These two great areas are separated by the Pine and Oak-Pine areas that stretch from the east westwards into the north German plain and by the Oak-Birch woods in the west. Beech woods with a greater variety of sub-dominant species and a rich ground flora occur on better-drained soils, as in the boulder clays on the Baltic Uplands or the limestones of southern Germany. They occur at lower altitudes on the periphery of the Alps.

2. *Oak-Hornbeam Woods*. These occur on brown forest soils and on

¹ In Hueck's work the identical vegetation map of the *Atlas des Deutschen Lebensraumes*, on a scale of 1:3,000,000, is reproduced for parts of Germany on a scale of 1:300,000.

soils with a shallow water-table in northwestern Germany. They include limes, elms, maple and beech. The shrub layer includes hazel, hawthorn, spindle, elder, bracken and bramble. More open woodland of this type occurs on the driest loess and limestone soils and here there occur plants with close affinities to the *steppe-heath* flora.

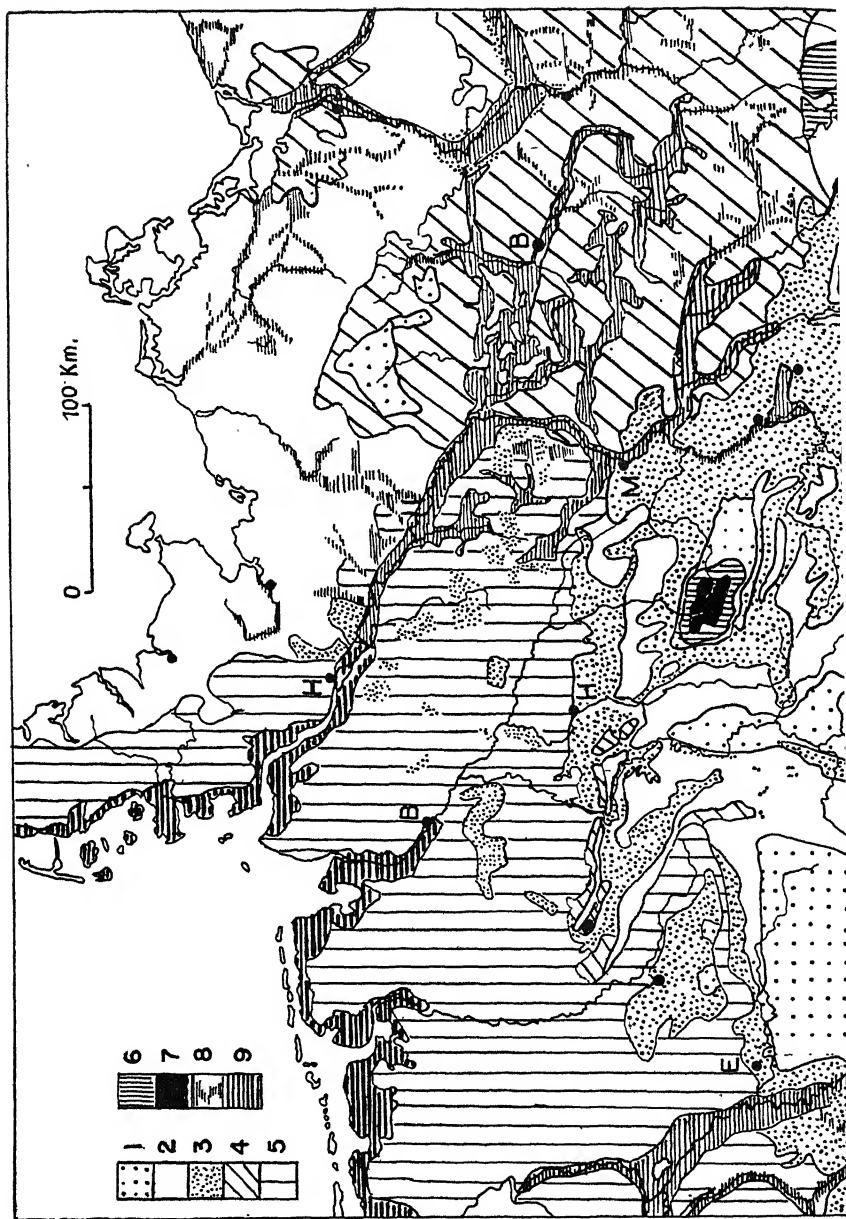
3. *Oak-Birch Woods*. These are found in northwest Germany on light, sandy, acid soils. This woodland also formerly covered the Lüneburg Heath and it is the chief type in the Münster and Cologne Bays as well as in much of Holland and Belgium.

4. *Scots Pine Forest* (*Pinus sylvestris*; German, *Kiefer*). This forest occupies nearly a half of the forested area of Germany. It is essentially a lowland tree and is dominant in the northeastern lowland. It reaches altitudes of 4,000 ft. in the Central Uplands. It is the dominant tree on lighter and sandier soils, its place being taken by spruce, oak and hornbeam on the moister soils. The tree, of course, is indigenous and with the beech (that is dominant in the west) the two are the chief German trees. The eastern area reaches west to the Elbe. Smaller islands are found in Nuremberg and in the Upper Palatinate.

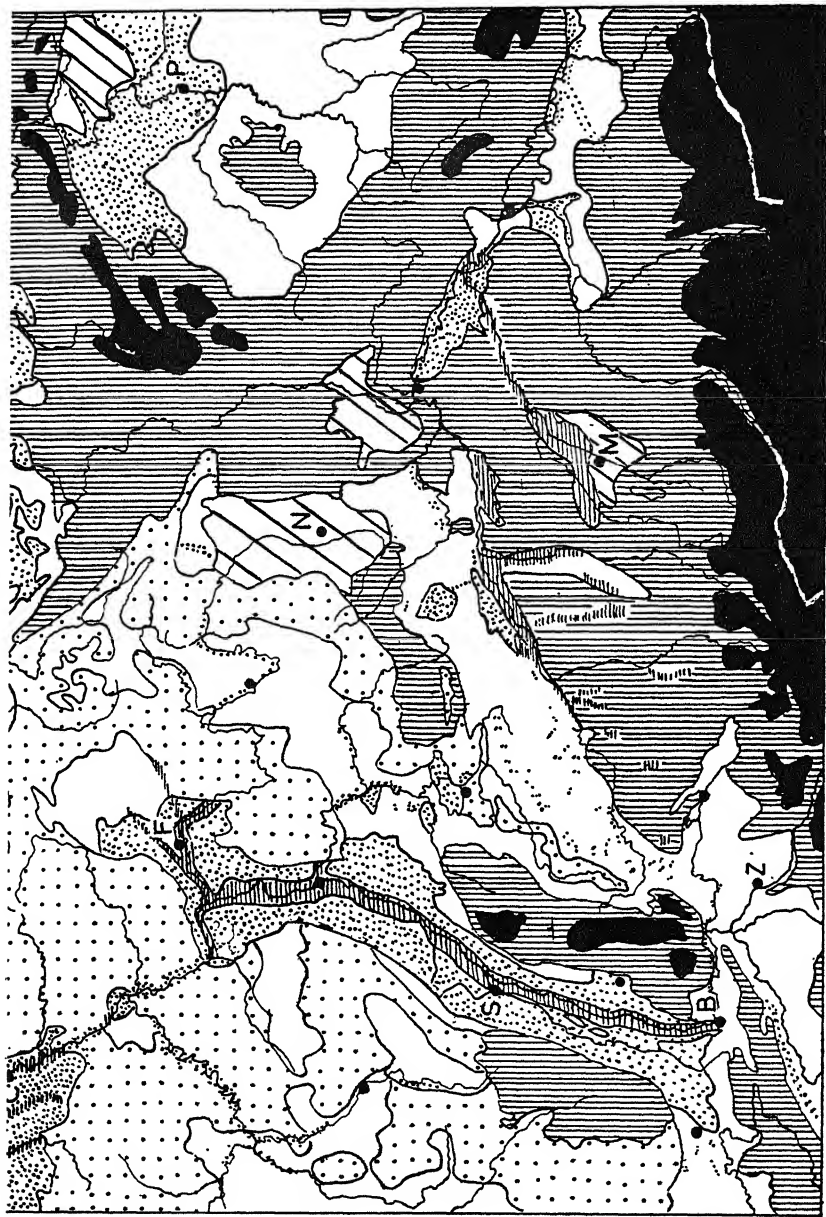
5. *Spruce Forest* (*Picea abies*; German, *Fichte*). This is especially characteristic of the highlands, to which it is native, whereas its main domain is in the north and east of Europe. It lies above the beech zone and reaches up to the tree line. The upper limits increase southwards so that in East Prussia it occurs down to sea-level. In the central German uplands it begins above the beech at 2,000 ft. in the Harz and 4,000 ft. in the Bavarian Alps, and reaches in the same places 3,000 and 5,000 ft. respectively. This is the main tree used in plantations and grows to a great size and yields excellent timber. Its best zone is between 1,500 and 4,000 ft. There is often a narrow zone between the spruce and beech in which occurs the silver fir (*Abies alba*; German, *Tanne*), that is native to the mountains of southern Germany. The fir likes moister and warmer conditions than spruce and occurs below it, intermingled with beeches, up to altitudes of 2,600 ft. in central Germany and 5,000 ft. in the Bavarian Alps.

6. *Heath*. This has developed from the degeneration of an initial open woodland of oak and birch through human interference and it is characteristic of the acid, sandy, but drier soils of northwestern Germany. *Calluna vulgaris* dominates in drier areas and *Erica tetralix* in wetter areas.

7. *Moor*. Bog, to use the English equivalent, is formed when the water-table almost reaches the surface. It has a base of peat upon which lies the silt in which grow reeds and grasses and sedges that have thick interlocking roots in the peat. Soils are acidic. The sedges often occur in tussocks and in these drier places alder woods may grow (German,



1. Beech woods, acid soils, small variety of ground flora
2. Beech wood, less acid soils, big variety of ground flora
3. (a) Oak-hornbeam woods on brown forest soils with water table near surface. Includes ash, lime, elm, etc. and a shrub layer. (b) Oak-hornbeams on drier and warmer soils (especially loessic soils)
4. Pine forest with juniper, heather and moss ground flora



5. Natural heath and bogs with scattered oak and birch woods
6. Spruce-fir-beech forest
7. High forest altitudes (spruce, larch, mountain pine and alpine flora)
8. Wet alder woods (*Auenwald*) and bog and fen (*Moor*) on river plains
9. Halophyte coastal vegetation on *Marschen*

FIG. 12—GERMANY: NATURAL VEGETATION (from A. d. D.L.) (scale, 1 : 4 m.)

Erlensumpfmoor or *Bruchwald*). This type of vegetation is called *Flachmoor* or fen. In many areas the peat is highly acid and on it grow sphagnum mosses, cotton grasses and shrubs such as cranberry and bilberry. This vegetation often occurs in clumps with ponds and sedge-moss in the

Vegetation of Central Europe in Post-glacial Times (from Schrepfer, *Landeskunde von Deutschland, Der Nordwesten*, p. 51)

<i>Time Scale</i>	<i>Vegetation Period</i>	<i>Vegetation Form</i>	<i>Climate</i>	<i>Culture Period</i>
A.D. 1,000	Beech-Fir	Beginning of the Ro-dungszeit		Historical
1,000 B.C.		Primitive forest except settled areas	Present climate	Iron
2,000 B.C.	Beech-Spruce	Beginning of heath formation by human action	Temperature and humidity decreasing	Bronze
3,000 B.C.				Full Neolithic
4,000 B.C.	Mixed Oak Forest	Open woods and wet alder woods Raised bog	Post-glacial optimum Oceanic, Warm, moist	Early Neolithic
5,000 B.C.	Hazel-Pine	Parksteppe	Temperature and humidity increasing	Epipaleolithic
	Birch-Pine	Treesteppe		
	Birch	Birch tundra		Magdalenian
10,000 B.C.	Dryas	Dwarf scrub Tundra	Continental Cold, dry	

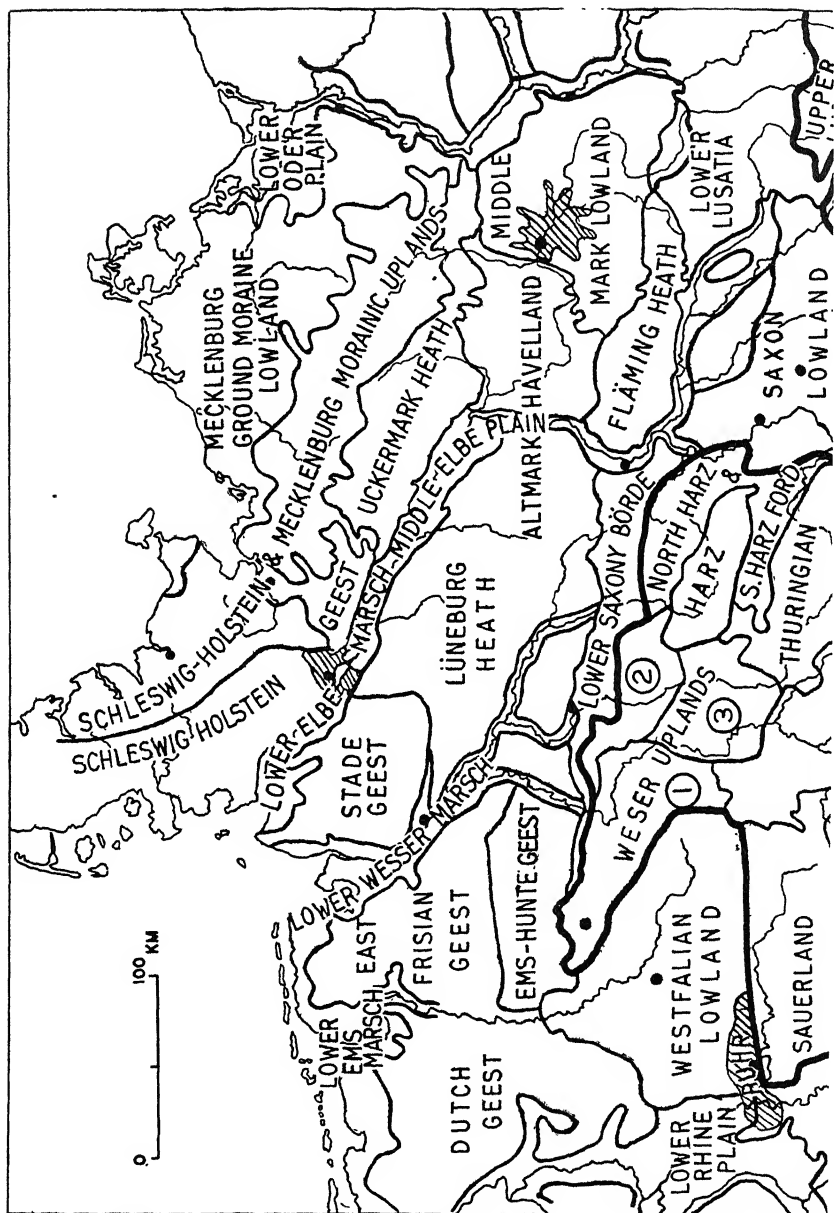
hollows. Heather, pines and birches also occur in these formations, though the highest points are treeless. These slightly raised areas rise above the water-table and are supplied only by rain-water and are thus very deficient in plant foods. They form "raised bog" or *Hoch-*

moor. They are soft peat bogs with sedges and mosses, and a further growth of heather, cotton-grass and cranberry on raised hummocks.

8. *Marshes and Dunes.* The plant community of riverine marshes has its climax vegetation community in the alder woods with tall willows and poplars (*Auenwald*), and even oak and hornbeam, but through human use on river floors these are normally damp meadows. This is the natural and cultivated vegetation that is characteristic of the wet, flat, marshy valley floors in Germany. It is described for the lower Rhineland on a later page. Grasses of various kinds are the only plants of the dunes. Salt marshes occur on the coasts of Germany where there is a big exposed foreshore of tidal silts. There is here a succession of vegetation as the silts are gradually built up above tidal level. This begins with the flats uncovered during spring tides only, and its marine grasses gradually raise the level to form marsh samphire (*Salicornia herbecea*); these are the so-called *Watten* or *Saliconica* marshes. These may then be protected by wickerwork fences built on sunken piles, behind which the silt surface is built up above *ordinary* tide level, so that it acquires a grass turf. This is only covered by spring tides, and fresh water is able to drain it of sea salt, and its grasses are then suited to grazing. Then such flats are protected by summer dikes from all except high winter tides. These *polders* are further divided, so that the inner marshes are protected by all-weather dikes, and are entirely free from flood.

THE NATURAL REGIONS OF WESTERN GERMANY

We have now examined in turn the general features of the surface relief, the soils, the climates and the vegetation of the west German lands. We may pause to study the maps on the scale of 1 : 4,000,000 on which these features are portrayed in some detail. Comparison of these maps (by using a trace of Fig. 13) will reveal the frequent coincidence of these physical conditions in such a way that areas may be recognized in which a given set of physical conditions occur and are, in fact, causally interrelated. Such a unit area is a natural region, within which, although there is a considerable diversity of local terrains, the same overall basic conditions prevail. The detailed patterns and characteristics of the smaller component unit areas will be discussed later, as will also the method whereby the character and extent of the larger natural regions may be more accurately determined. Suffice it here to state that comparison of the several maps will indicate major natural or physical unit areas into which western Germany may be divided and which serve as a framework for the study and interpretation of human occupance. These are unit areas that have no political significance and often do not have



Heavy lines show the five major divisions—Northern Lowlands, Central Uplands, Southern Scarplands and basins, Bavarian Plateau, Alps. The finer lines and names indicate the physical provinces.

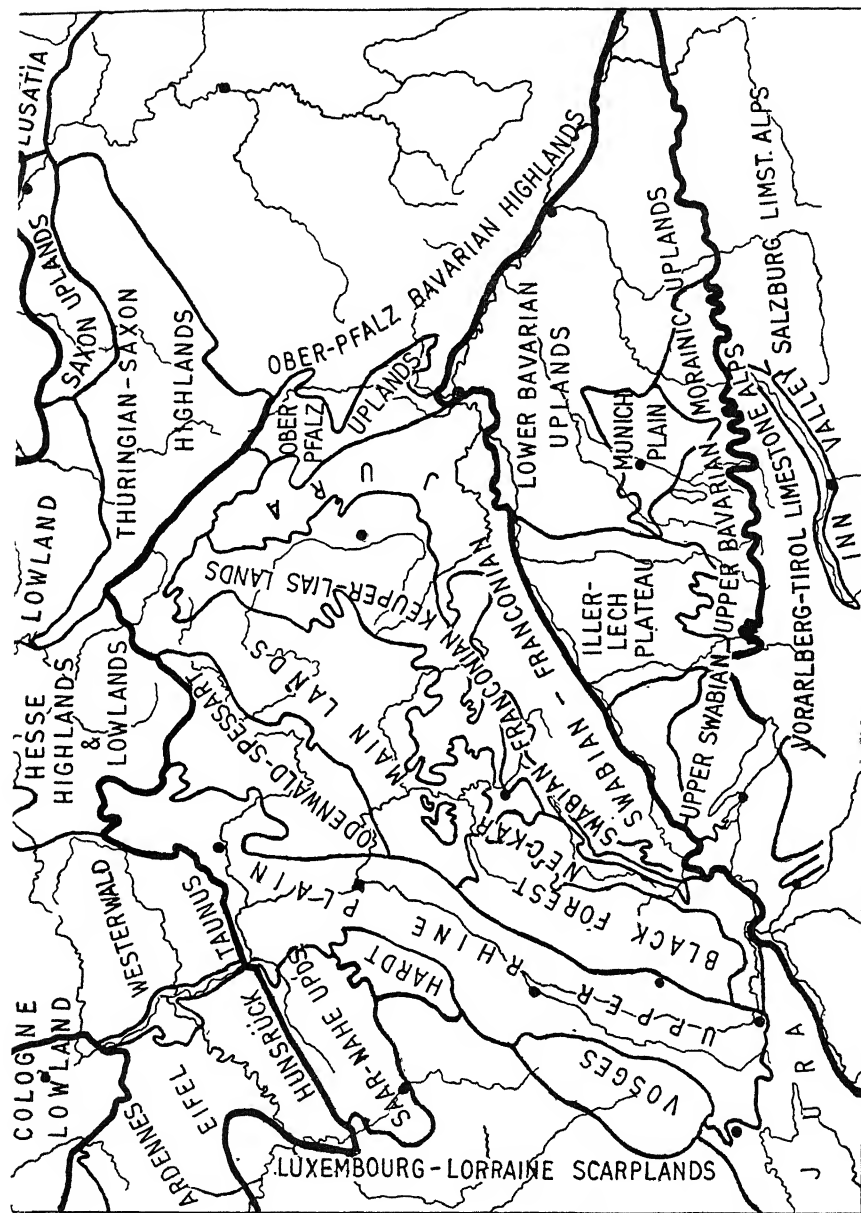


FIG. 13—GERMANY: NATURAL REGIONS (by the author) (scale, 1 : 4 $\frac{1}{2}$ m.)

Chief cities (over 250,000 people) are shown by block circles and the three principal agglomerations are shaded. Note that the Weser Uplands include:

1. The Westphalian Uplands
2. The Eastphalian Uplands
3. The Lüne Uplands

any distinctive popular name—though, fortunately, in some cases this is so—and consequently names must be coined or adapted. In order to avoid confusion of terminology, we have adopted the names recently suggested in German studies. The map and the regional names are shown in Fig. 13. The names are listed below. The student is advised to pay particular attention to these first overall maps and to the extent and names of the natural regions before proceeding with the book.

This work and the scheme of landscape areas on which it is based have been developed during the last ten years and it is only recently that we have become acquainted with the work of the *Amt für Landeskunde* in Germany, which is carrying out a similar detailed survey of the landscapes of Germany based on the standard 1:200,000 map. This work has been summarized by E. Otremba in the new periodical *Erdkunde*. Otremba also presents a generalized map on the same scale of 1:3,000,000 as the series presented here and as the series in the *Atlas des Deutschen Lebensraumes*. There is a remarkable agreement between our generalized map and that of Otremba. In order to ensure as large a common measure of agreement as possible we have used for almost all our divisions the same names as are suggested by Otremba. These we shall use throughout the book in reference to the natural regions.

The Natural Regions of Germany

The Northern Lowland

West

Stade Geest.
Lüneburg Heath.
Altmark.
East Frisian Geest.
Ems-Hunte Geest.
Dutch Geest.
Lower Weser Marsch.
Lower Ems Marsch.
Lower Rhine Plain.
Westphalian Lowland (*Bucht*).
Cologne Lowland (*Bucht*).
Lower Saxony *Börde*.

East

Mecklenburg Morainic Lowland.
Lower Oder Plain.
Schleswig-Holstein Morainic Upland.
Mecklenburg Lake Upland.
Schleswig-Holstein Geest.
Uckermark Heath.
Middle Elbe Plain.
Havelland.
Middle Mark Lowland (*Platte*).
Fläming Heath.
Lower Lusatian Heath.
Saxon Lowland (*Bucht*).
North Harz Lowland (Foreland).
South Harz Lowland (Foreland).

*Central Uplands**North**Rhine Massif (or Plateau):*

Sauerland .

Westerwald.

Ardennes.

Eifel.

Hunsrück.

Taunus.

Moselle Valley.

Lahn Valley.

Hesse Highlands and Lowlands.

Weser Uplands	{	1. Westphalian Uplands.
		2. Eastphalian Uplands.
		3. Leine Uplands.

Harz Highland.

Thuringian Lowland.

Thuringian-Saxon Highlands.

Upper Lusatian Uplands.

Saxon Uplands (*Bergland*).*South*

Luxembourg-Lorraine Scarps and Vales.

Saar-Nahe Uplands (*Pfälzer Bergland*).

Vosges.

Haardt (*Pfälzerwald*).

Upper Rhine Plain.

Odenwald-Spessart-Rhön.

Black Forest.

Neckar-Main Lands (Limestone and Loess Gaüe)	{	1. Swabian Gaüe.
		2. Kraichgau.
		3. Franconian Gaüe.
		4. Upper Werra Lowland.

Swabian-Franconian Keuper-Lias Lands.

Scarped Hills (*Berge and Filder*).

Swabian-Franconian Jura. Limestone Plateaus with deeply dissected Scarp Zone.

Oberpfalz Lowland (Naab Lowland).

Bohemian Forest (*Oberpfalz -and Böhmisches Wald*).*Bavarian Plateau*

Upper Swabian-Upper Bavarian Morainic Uplands.

Iller-Lech Plateau (*Platte*).

Lower Bavarian Uplands.

Vorarlberg-Tirol and Salzburg Limestone Alps.

Munich Plain.

Inn Valley.

PART II

THE PEOPLES

The German character lacks the sharp outlines and the distinct form we recognize in the French and British character. In addition to this, we have continually to bear in mind Germany's peculiar character as a "nation of nations", the differences of racial character being so many that we find difficulty in recognizing any national character common to all the German territories.—Röpke, 1946.

CHAPTER 4

THE GROWTH AND SPREAD OF THE GERMAN PEOPLES

THE PHASES OF SETTLEMENT

THE SETTLEMENT of the German-speaking tribes after the period of the Folk Migrations marked the effective beginnings of permanent settlement of the German-speaking lands. During the last centuries before Christ there emerged in southern Scandinavia and along the southern shores of the Baltic, east of the lower Elbe, a people of a distinct racial type, with a distinct kind of Indo-European language. From this centre there migrated two main groups, the East Germans and the West Germans. The former engaged in a series of spectacular raids throughout western Europe. The West Germans moved more slowly and less spectacularly in families and tribes. Through the slow pressure of other Germanic and Slav tribes behind them, they worked their way westwards to the Elbe basin, and thence to the Roman frontier on the Rhine and the Danube. This period extended from about 500 B.C. to 500 A.D.

In the fifth century A.D. occurred the great incursions of the Germanic tribes into the lands of the Roman Empire west of the Rhine and south of the Danube. The Franks and the Alemanni, after long contact with Roman civilization in their homelands just outside its frontiers, were now pushed from behind and spread into the Rhinelands, so that the present western frontier of German dialectic speech was virtually fixed by the tenth century. The Franks gained temporarily the overlordship of northern Gaul as far as the Somme, the Aisne and the Argonne uplands, and though this Frankish conquest was of short duration, it affected the development and character of institutions in these lands. Pressure from the east still came from the Germanic tribes—the Saxons, the Bavarians, and the Thuringians—and, beyond them, the Slavs. But the tide was stemmed by the frontier defences along the Elbe, Saale, Naab and Danube rivers, that were built by Charles the Great in the ninth century. This frontier in the north remained the effective ethnic and cultural divide between the Germans and the Slavs until about 1200, but to the south of the Danube the Enns river was crossed in the eleventh century, and the limits of the Reich and of German settlement in the eastern Alps were reached in the peripheral lowlands by 1200.

Three divides thus emerged in the formative period of the German peoples, viz. the linguistic divide in the west between French and Ger-

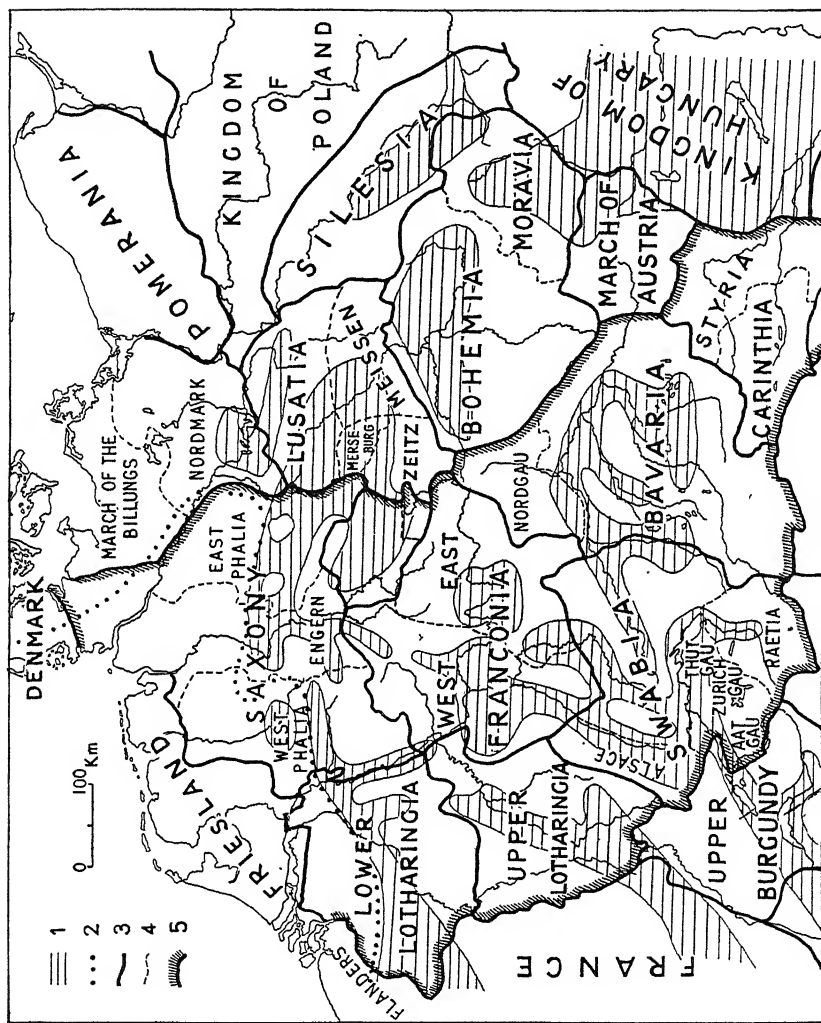


FIG. 14—CENTRAL EUROPE: TRIBAL DUCHIES AND MARCHES, 950—1250 A.D. (scale, 1 : 10 m.)

man, the strategic divide of the Rhine, and the cultural divide of the Elbe-Saale between German and Slav. These lines recur again and again in the changing geographic kaleidoscope of human relations in the history of central Europe.

Areas of Tribal Settlement. The German hearthlands is an appropriate term for the first areas of settlement of the German tribes on land which was relatively free of forest with light, well-drained soils, amenable to plough cultivation. These forest-free lands lay in the loess and limestone areas, on the fertile and drier sand and gravel patches in the northern heathlands, and on gravel terraces in the valleys (Fig. 14).

There is abundant archæological evidence to prove that these areas had been occupied continuously by man from Neolithic times onward. Here the Germanic tribes gradually settled during the period 500 B.C. to A.D. 500 and federated into groups of "peoples" called *Volkstämme*. They settled in scattered islands, separated by forest and marsh, each of which was a political unit known as a *Gau*. These were grouped into large territories, that became the tribal dukedoms, each of which in turn was bounded by a wide zone of uninhabited forest land, called the *Mark*, which often bears to this day the name of one of the tribes it separated, e.g. Frankenwald, Thüringerwald and Böhmerwald. The areas of settlement in the tenth century of the tribal groups and the extent of the dukedoms are shown in Fig. 54, pp. 324, 325.

The Salian Franks had already reached the Meuse in the third century A.D., but in the period A.D. 350-450 they were pushed westwards by the Saxons. The former settled in the lowland, later known as Flanders, between the sea and the woodlands of the *Sylva carbonaria*, south of the Scheldt, and west to the hills of Artois. The Riparian Franks (including the Hessians) were located on either side of the Rhine south as far as the northern end of the upper Rhine plain. The Franks also extended their settlement during the Merovingian and Carolingian periods up the Main river to the Thuringian highland and southwards to the lower Neckar lands.

The areas of Frankish settlement thus formed a wedge between the Saxons to the north and the Alemanni and Bavarians to the south. The Alemanni were settled south of the Franks in the upper Rhine plain, the upper Neckar basin, and around Lake Constance. The Bavarians settled between the Lech and the Enns rivers in the Bavarian Plateau. The Saxons occupied the northern Loess Belt and fertile patches in the northern heathlands between the Ems and Elbe rivers and also spread into the uplands immediately to the south. Their chief strongholds were in the Weser uplands between the Rhine and the Weser, where they long maintained a stubborn resistance to the Frankish conquerors. The Thuringians settled in the loess lowland of Thuringia. The Frisians

made their homeland, as far back as the fifth century B.C., in the marshlands and islands of the northern coast, from the north of Holland to the west of Schleswig-Holstein and Denmark. They placed their isolated settlements on artificial mounds or *terps* that were raised slightly above the level of the marshes and the tides. For centuries they were seafarers, conveying pilgrims and missionaries between the Celtic lands of Britain and central Germany, though their power waned with their defeat by Charlemagne in the eighth century.

During the early Middle Ages from about A.D. 500 to 1000 the front of German settlement gradually expanded eastwards against the Slavs to the Elbe-Saale rivers and to the Bohemian and Bavarian Forest highlands. The Frankish Empire had its base in the Rhinelands, and, long associated with Roman civilization, it absorbed much of its culture. From the Rhineland base, settlement and Christian culture were carried eastwards by the Franks, a mission that was later continued by the Saxons in the northeast and by the Bavarians in the southeast. The Franks conquered the Alemanni in the early sixth century, and thus extended their domain to include the whole of the Rhinelands, where they established their capital at Frankfurt. By the eighth century the Frankish Emperors—the Merovingians and the Carolingians—had conquered the other German tribes—last of all, the Saxons—and the Empire of Charlemagne united all the German tribes. The Franks then drove a wedge of settlement eastwards, between the Saxons to the north and the Alemanni and Bavarians to the south, into the loess lands of the middle Main basin, up the Wetterau into Hesse, and eastwards into Thuringia. Already in the tenth and eleventh centuries the Saxons had shifted their chief seats of settlement into the loess zone on the northern border of the Harz mountains, and they gradually settled in these lands eastwards as far as the Elbe. The Bavarians, too, after the defeat of the Magyars in 955, began to spread into the *Ostmark*, which had been established by Charlemagne in 803.

The Age of Forest Clearance. The Franks commenced the clearance of forest, but this process did not really set in on a big scale until after about A.D. 800, when the German peoples launched a vast attack upon forest, marsh and heath, which lasted for four centuries, until about A.D. 1350. This is the era known as the Age of Forest Clearance—the *Rodungszeit*. In the uplands, forest clearance extended up to some 2,000 ft., the upper limit of successful rye cultivation. Mining drew settlers far above the limits of farming into the uplands in the west and, in the later Middle Ages, into the Bohemian uplands and the northern Carpathians.

The town, too, appears in these lands in the early Middle Ages. The Church, the secular administration, and the military authorities, needed

fixed points of settlement in the open countryside. Here grew the first towns, and by the middle of the twelfth century the medieval conception of a town (*civitas*) as a self-governing community had developed, and numerous market settlements and towns were founded. In 1200 there were about three hundred towns in the west German lands. During the ensuing two centuries virtually all the towns came into existence, a grand total in the west German lands of nearly two thousand, founded to serve as seats of defence, administration, industry and trade for their surrounding areas.

Colonization of the Trans-Elbian Lands. The eastern limit of the compact area of German speech was fixed by the end of the Middle Ages by the colonization of German settlers from the west, and by the conquest and absorption of the native Slav peoples. In the eleventh century, the border provinces or marchlands stretched east of the German dukedoms in a belt from the Baltic Sea to the head of the Adriatic. They included the marches in the Northern Lowland between the foothills of the Elbe-Saale and the Oder and the marches south of Bohemia that covered the eastern foothills of the eastern Alps. In the southeast of the Reich, after the defeat of the Magyars in 955, the Bavarians extended from their hearthland in the Bavarian Plateau throughout the marches of the eastern Alps, and reached the limits of the Reich before the trans-Elbian movement had commenced.

To the north the Elbe-Saale frontier remained the effective eastern frontier of German settlement until the latter half of the twelfth century. Then there commenced that great eastward movement of conquest, colonization, and Christianization which, under the ægis of bishop, monk, noble, and merchant, continued steadily for two hundred years. During this period there was added to the lands of German speech an area equal to that of the motherland in the west.

The first lands to be affected lay immediately east of the Elbe-Saale frontier. They included Mecklenburg, Holstein, the Altmark and Mittelmark of Brandenburg, and the middle Elbe Basin. The Slavs in these lands—Wends in the north and Sorbs in the south—were subjugated and converted to Christianity. After 1200, villages and towns were founded by German immigrants. A second zone of settlement farther eastwards included Pomerania, the Neumark, Silesia, and the upland rims of Bohemia. Here German settlement proceeded peacefully at the invitation of independent Slav princes throughout the thirteenth and early fourteenth centuries. "Village after village, parish after parish over vast areas, with cities and towns in their midst, at favourable locations, are the grand achievement of a purposeful and energetic system of planned land settlement."¹ A third zone was formed by the states of

¹ R. Köttschke and W. Ebert, *Geschichte der Ostdeutschen Kolonisation*, 1937.

Poland and Bohemia, whither Germans were invited to settle as foreigners with special privileges in lands which remained dominantly Slav in population and speech. German settlement also penetrated the uplands that encircle the Bohemian Plateau, as part of the general uphill movement of farming and mining communities to which we have already referred, and spread into the Czech-speaking land in the heart of Bohemia. In Poland, German settlement spread into West Prussia and Posen, but it was always intermingled with a large native population. Germans and Slavs lived in separate villages and maintained their distinct character. This, too, was formerly the case in Silesia, until, under Frederick the Great, German speech became more widespread, although till 1918 the peasantry of Upper Silesia still clung to their Slavic (Polish) dialect. Town development on a large scale in both Bohemia and Poland was due to the foresight of the rulers. They invited German emigrants, who long formed the bulk of their burgesses' class. These towns enjoyed German law.

German settlement spread still further afield, mainly in towns which were scattered throughout east-central Europe. Villages and towns spread along the Galician Foreland on the northern border of the Carpathians on the route which ran from Cracow to Kiev, as far as Lemberg (Lwow), a German town. They also penetrated the Carpathian foothills, where towns were established for the mining of salt. The Teutonic Knights controlled all the Baltic provinces northwards to the Gulf of Finland in the thirteenth and fourteenth centuries, and the Hanseatic League monopolized the trade. The peasant population in these provinces remained alien in speech, except in East Prussia, where, through a war of extermination and systematic land settlement, the front of close German settlement extended. Even here settlement in the fifteenth and sixteenth centuries penetrated only sporadically into the wilderness of the interior, where, though the Prussian tongue has gone, the Masurians still retain their Polish speech. In Esthonia and Latvia, German settlement was restricted to the towns, some twenty in number, and to a land-owning aristocracy, the so-called Baltic Barons. On the coastland, as far as Riga and Reval, a series of merchant cities grew up, modelled on Lübeck, the mother of them all. All these towns had the same stamp of origin, growth and function, and they were closely associated with the Hanseatic League.

German settlers were invited into Slovakia and Transylvania by the kings of Hungary. They established mining settlements in the area south of the Tatra, known as the Zips region, which in the thirteenth century contained twenty-four German towns, that were engaged mainly in the mining of silver and copper. Germans migrated to the Siebenburgen in Transylvania in the twelfth century to defend it against nomad invaders from south Russia. It has been estimated that in 1500 there

were some 70,000 Germans in this area, 20,000 of whom lived in its fortress towns.

The Period 1400-1800. The eastward movement of German settlement and the dominance of German culture and commercial influence throughout central Europe waned in the latter half of the fourteenth century. This was due to a variety of causes. The first was the national awakening of the peoples of central Europe, who had hitherto drawn eagerly upon German culture and trade. Poland and Lithuania reached the greatest days of their cultural and political development in the later Middle Ages and after, and completely defeated the Teutonic Order at Tannenberg in 1410, after which even East Prussia was held as a fief of the king of Poland. The Hussite movement in Bohemia was as much a rising against German influences as a religious movement. Hungary grew to power in the Danube plains, only to be crushed by the Turks in the sixteenth century, who swept to the gates of Vienna, and remained a menace which was not finally removed until their final defeat in 1683. The Hanseatic League after 1370, when it had defeated Denmark, controlled the Baltic Sea and its trade through the medium of a far-flung front of trading stations, reaching from southern Scandinavia (Stockholm and Oslo) to central Russia. But its power, too, waned towards the end of the fifteenth century.

Further, social and political conditions in the German lands reduced the stream of emigration. The ravages of the Black Death in the middle of the fourteenth century reduced the population by one-third. Moreover, prospects of social freedom and economic opportunity were offered by the towns in the west as well as by the lands in the east, and there was a definite local movement in the western lands from the villages into the towns. In the eastern lands, a social system gradually crystallized which without large-scale land reclamation could not absorb more colonists. The land-owning nobility increased their feudal control and gradually deprived the peasants of many of the privileges they were accorded at the time of their first settlement. The nobles proceeded to consolidate their lands at the expense of the peasants and to build up those large estates which characterize the east. Thus, there emerged a landless peasantry, as opposed to the small and independent farmer class which emerged in the west.

The German economic historian, Gustav Schmoller, has summed up the significance of the growth of population in the Holy Roman Empire in the Middle Ages in the following terms: "The increase of population from A.D. 500 to 1340, of two- to threefold, to a total of twelve millions, was a greater achievement than the increase from fifteen to sixty-four millions from 1700 to 1900."

In the three centuries after the end of the Middle Ages, population in

the aggregate changed little in numbers, and villages and towns decreased rather than increased both in number and in size. There was, moreover, no change in the front of German speech; indeed, until the end of the eighteenth century, the eastern frontier was scarcely able to maintain its position. The Thirty Years' War spread havoc and misery over town and country alike. Germany had some sixteen million inhabitants in 1618 but only some four millions remained in 1648. In the west a loss of three-quarters was general to most areas; in the east the losses seem to have been somewhat less, as in Brandenburg, where half the population was killed off. During the next 150 years there was a good deal of emigration from western Germany both to the New World and to the eastern provinces. But the latter drew their colonists largely from outside Germany. Of special significance in this period is the recurrence of large-scale land settlement and colonization in the eastern lands. The kings of Prussia set about the rehabilitation and reclamation of their poor lands in the Northern Lowlands. Marshes were drained, forests preserved, methods of cultivation improved, and large estates subdivided. East Prussia received some 1,500 settlers, West Prussia, annexed from Poland in 1772, quickly received some 10,000 settlers. After the annexation of Silesia from Maria Theresa, Germanization and settlement proceeded apace, although the people of Upper Silesia retained their Slav dialect. Altogether it has been estimated that one million emigrants entered various parts of Prussia during the period from 1640 to 1786, bringing the total population of Prussia in 1800 to some six millions.¹ At this time probably one-sixth of the population of Prussia were either colonists or descendants of colonists of foreign extraction who had entered since 1640, including Dutch, Czechs and, in particular, French Huguenots. If we recall that the native stock in these eastern lands of modern Prussia was Slavic, we realize that the proportion of German blood was extremely small.

In the Danube lands settlement was not resumed until after the withdrawal of the Turks. In the eighteenth century the settlement of the plains was undertaken by the rulers of Hungary, and especially by Maria Theresa. After 1763 the Banat, the Bascka and the Bakony Wald were settled by Germans from southwest Germany. Similar colonization of Germans took place in the lower Volga lands in the south Russian steppes at the invitation of Catherine the Great.

Apart from these movements in the eastern provinces of Russia, and the reclamation of the peatlands of northwest Germany by Dutch engineers, there was little change in the pattern of settlement or of the economic and social structure of the German-speaking peoples. The political reorganization of the German Confederation in 1806 effected no

¹ Kötschke and Ebert, *op. cit.*, p. 141.

immediate changes in social or economic life. The development of modern society began slowly in the first half of the nineteenth century and was quickened by the construction of railways in the middle of the century. But the Reich of 1871 differed little from the Confederation of 1806. We shall discuss later the character of these changes, and their effects upon the geographical structure of society, and merely note here the main demographic changes in population during the last two generations, i.e. from about 1870 to 1939.

Growth of Population by Countries (from Welte)

Country	Population 1830, Millions	Density, 1830, per Sq. Km.	Population 1930, Millions	Increase, 1830-1930, %	% of the Increase in Towns with over 20,000 Inhabitants
Germany ..	26.5	56	63.2	140	70
Netherlands and Belgium	6.3	98	14.8	135	75
Great Britain and Ireland..	21.3	70	49.5	130	80
Baltic States	2.5	14	5.3	112	30
Poland ..	15.0	38	32.0	113	26
Rumania ..	8.0	27	18.0	125	19
Yugoslavia ..	6.5	25	14.0	115	18
Switzerland ..	2.0	48	4.0	100	50
Austria ..	3.5	41	6.7	81	63
Czechoslovakia	8.3	58	14.7	77	30
Hungary ..	5.2	55	8.6	65	70
Denmark ..	1.8	42	3.5	81	60
France ..	31.8	58	41.8	30	80
TOTAL POPULATION	138	—	275	—	—

Modern Growth. The greatest increases of both aggregate and urban population are recorded in Germany, Holland and Belgium, and Great Britain, the greatest increase being in Germany (see table). In these countries the total population more than doubled, and some three-quarters of this increase was due to the growth of towns with over 20,000 inhabitants. A high increase (over 100 per cent) of the total population is recorded in the Baltic states and the states of Poland, Rumania and Yugoslavia in east-central Europe, though in all these states the proportion due to the towns is very small. The smaller states (group 3) record increases from 65 to 100 per cent, with a high proportion (50 per cent or over) due to the growth of towns. (Czechoslovakia comes out low in the

scale, owing to the inclusion of Slovakia; the increase due to towns in Bohemia and Moravia is much higher.) In Hungary the abnormally high proportion recorded as urban is due to the inclusion in this category of great semi-urban agricultural villages, and the predominance of its one great city, Budapest, over the total population of the state. France shows a very small aggregate increase (30 per cent), the bulk of which is attributable to towns.

In 1939 the population of the Reich (1937 area) was 69·3 millions, a total that compares with 50 millions for the United Kingdom, and, without Russia, comprises one-fifth of the population of Continental Europe. This total population lived on an area of 183,500 square miles (roughly twice the area of the United Kingdom) with an average density of 377 persons per square mile as compared with 500 in the United Kingdom, 180 in France, 700 in Belgium and 770 in the Netherlands. During the period from 1871 to 1939 the total population increased from 41 to 69 millions. In 1871 62·6 per cent of the total population lived in rural communities (places with under 2,000 inhabitants), and 37·4 per cent in towns. In 1910 the position was reversed, 38·3 per cent living in rural communities, 38·9 per cent in country towns and 22·8 per cent in large cities. This complete reversal was, in fact, effected by the first decade of this century, so that the revolution in the social and economic structure of Germany took place within one generation. The modern growth of industry and commerce has resulted in the tremendous increase of urban populations and the growth, in particular, of great agglomerations. In spite of this, however, the density of population in the great rural areas of the Northern Lowlands and the Central Uplands remains the same as seventy years ago. The main areas of increase have been in the great towns, and in the wide zones of the middle east-west belt from Silesia to Aachen and in the Rhinelands from Aachen to Karlsruhe, and in the northwestern lowland, Bavaria, and the middle Elbe Basin and Lusatia. All the rest of the country records decreases during the 1870-1930 period.

Percentage of Total Population living in districts with:

	2,000 <i>Inhabitants</i>	2-5,000 <i>Inhabitants</i>	5-20,000 <i>Inhabitants</i>	20-100,000 <i>Inhabitants</i>	100,000 <i>Inhabitants</i>
1871 ..	62·6	12·9	11·6	7·5	5·4
1910 ..	38·3	11·3	13·8	13·8	22·8
1933 ..	32·8	10·7	13·4	13·0	30·1
1939 ..	30·1	10·8	13·8	13·7	31·6

The steady increase of urban population continued in the 'thirties. Cities with over 100,000 people had 31·6 per cent of the total population in 1939 as compared with 22·8 per cent in 1910 and small towns (2,000-

100,000) remained almost constant at 38.3 per cent in 1939 and 38.9 in 1910. On the other hand, the *Landgemeinde* with less than 2,000 inhabitants had 30.1 per cent of the total in 1939 as compared with 38.3 in 1910. Since the war the growth of the population in the big cities has in general slowed down or decreased owing to the lack of homes and the lack of industrial employment. Undestroyed cities and undamaged small towns, on the other hand, have had some remarkable increases.

Germans have not only moved to towns. They have emigrated overseas. It has been calculated that in the hundred years from 1813 to 1913 about six million Germans left the Reich for overseas. The biggest emigration was 252,000 in 1854. This emigration from 1894 to 1913 reached 40,000 per year. In 1919 the figure was 3,000 only, in 1920 it was 8,500, in 1921, 23,000, in 1922, 35,000, and in 1923, 115,000. After this date, emigration dwindled to an average of some 15,000 a year. But now the renewal of emigration seems to be one way of solving the problem of surplus numbers.

Post-War Changes. The number of foreign workers in Germany was negligible in 1933, but after this date immigration, both permanent and seasonal, was renewed. The total number of foreigners in the Reich in 1933 was 683,000, and in 1939, 641,000.¹ Wholesale transfer of Germans took place during the war. About 600,000 had been transferred by spring 1942 from east and southeast Europe into Germany or German-occupied lands. The foreign labour employed in Germany increased enormously during the war. The total probably reached 6.5 millions at the peak in early 1943, including civilians and prisoners of war.² At the end of the war U.N.R.R.A. found about ten million such persons, and returned nearly all of them to their homes in other lands. The remainder are known as "displaced persons" and numbered 850,000 at the end of 1946.

We have witnessed in the last ten years far-reaching changes in the distribution of the German peoples, as of other peoples on the borders of, and in, east-central Europe. The German peoples have been pushed westwards—have in part fled westwards—since 1945 from their scattered eastern outposts, especially in the Baltic states and Slovakia, while the Germans of western Poland, the Sudeten land on the periphery of Bohemia, and throughout the eastern provinces of Germany, have moved westwards into the occupied zones of Germany. In consequence, the front of German settlement has retreated within two years as far as the eastern boundary of the Russian and American zones of occupation.

Today, in a territory occupied by the four Powers of 353,000 sq. km. with 65 to 70 million people, there are 200 people for every square kilo-

¹ *Statistisches Jahrbuch*, 1938, p. 23.

² E. M. Kulischer, *The Displacement of Population in Europe*, International Labour Office, Montreal, 1943.

metre. The Allies reckoned with a transfer of $6\frac{1}{2}$ million people from the neighbouring states into Germany, consisting of $3\frac{1}{2}$ from Poland, $2\frac{1}{2}$ from Czechoslovakia, half a million from Hungary, and 150,000 from Austria. But to date out of Polish-occupied territories alone there have come $6\frac{1}{4}$ million Germans into the four zones of occupation, as well as $3\frac{1}{2}$ million refugees from other areas, so that the new Germany has absorbed an addition of 10 million people. And this movement is presumably not yet complete, for there are still 350,000 in Polish territory east of the Oder-Neisse line, 200,000 in each of Czechoslovakia and Hungary, and 100,000 in each of Denmark and Austria. The total number of refugees reached 11.4 million in July 1948. Somehow or other, by emigration or by the renewed growth of industry as a means of employment, these people must be absorbed.

These movements have caused some remarkable changes in the distribution of population in Germany. The French Zone in the southwest has been very little affected by them. In North Rhine-Westphalia many of the great cities that were seriously damaged record decreases of population. Schleswig-Holstein, on the other hand, records a total increase of 66.8 per cent, Niedersachsen, 41.7 per cent, and Mecklenburg, 52.2 per cent. The population in many rural areas has doubled since 1939!

Demographic Trends. So far the main facts concerning the modern growth of Germany. Let us turn now to its demographic trends in relation to the states of Europe as a whole.

The great growth of population in Europe since the Industrial Revolution was effected for the most part in the latter half of the nineteenth century and was caused by a reduction of the death rate rather than by a rise of births. The development of transport permitted foodstuffs to be imported and the conditions of living improved. Housing, clothing and shelter, public health, and sanitation were improved and the ravages of disease reduced. These living standards, however, for the broad masses of the people in Germany, as in all other European countries, were appallingly low at the opening of the century and, indeed, down to the opening of World War II.

Death rates, nevertheless, began to fall in the late nineteenth century and showed a remarkable and rapid decrease after 1900. Death rates in Scandinavia fell to 20 per 1,000 in the 'sixties, in Finland in the 'seventies, in the Netherlands in the 'eighties, in Italy and Austria about 1910, in most of eastern Europe and the Balkans in the 1920s, and finally in Rumania and probably the Soviet Union in the 1930s.¹ Birth rates, on

¹ For all these data, see Frank W. Notestein and others, *The Future Population of Europe and the Soviet Union, Population Projections, 1940-1970*, League of Nations, Geneva, 1944, especially Chap. II.

the other hand, remained high and did not show any particular trend of decrease or increase except for France where the birth rate has steadily declined since 1820. The general decline did not begin in western Europe until 1870 and then it decreased more rapidly than the death rate and spread from west to east. It dropped to 30 per 1,000 in France in 1830, in Sweden in 1880, in the rest of Scandinavia and England in the 1890s, in Germany, the Netherlands, Czechoslovakia and the Baltic States between 1900 and 1910, in Hungary, Italy and Spain in the 1920s, and in Poland and the Balkans in the 1930s. Only the U.S.S.R. had a birth rate above 30 per 1,000 in 1939. Thus we note, in general, a spread of the decreasing birth rate eastwards from France into central Europe, leaving the U.S.S.R. with an outstandingly high birth rate today.

Until 1910 Germany had the highest birth rate among the countries of northwestern and central Europe (including Czechoslovakia and Hungary), but by 1933 it had one of the lowest, the net reproductive rate in that year being 0.76. The Nazis did what they could to change this situation, in which there are not enough females being born to maintain the same number of females each year. This is a state of affairs, of course, that is common to all the countries of the western world and western Europe. The annual rate of increase from 1933 to 1939 was 0.83 as compared with 0.55 for 1925 to 1933. In 1939 the birth rate was 20.3 and the net reproductive rate was about unity. But even this slightly increased rate if maintained would not prevent an eventual decrease in the total population of Germany. Population on the basis of the fertility levels of the 1937-8 year would have continued to increase until 1955, and in 1970, Germany, without radical changes of boundaries, would have had the highest population of all the states of Europe outside Russia. This forecast, however, is of dubious accuracy, for Germany has suffered tremendous losses during the war and the population has had great upheavals through the shifts of population.

Austria and Switzerland have much the same demographic trend as Germany. In the middle 'thirties Austria had the lowest birth rate and the lowest net fertility in Europe and was losing population by natural increase. But it enjoyed a revival after the *Anschluss* and in 1939 and later years its birth rate was higher than that of the old Reich. Bohemia and Moravia also show the same demographic characteristics as Germany and Austria. Slovakia and Ruthenia are east European from the demographic standpoint, since they record high increases.

The rapid growth of population in western Europe is at an end. Europe has reached its maturity and population stability is being approached in a rapidly changing demographic world. The population totals of individual countries are rapidly approaching their peaks, and all the countries west of the U.S.S.R. are headed for stability or decline.

Careful estimates by experts such as Notestein and others show that all the countries of northwestern and central Europe will cease growing by 1970, most of them by 1960. In consequence, western Europe in the future will have to face the basic problems of the economic and social adjustment of its populations to resources, of a stationary or declining population, and to matters of immigration from other areas into western Europe. This adjustment has been going on for decades in France, while Britain is possibly approaching this stage, and the Germans had to import large numbers of foreigners to carry out the excessive economic programme during the war years. Furthermore, all western European countries will have to readjust their economic, political and strategic attitudes to the increasing importance of larger numbers in eastern Europe, or, in other words, the Soviet Union. Even assuming the same rates of fertility in western Europe, the population of the Soviet Union will be 25 millions greater than that of western Europe in 1970.

The geographical distribution of and changes in the birth rate throughout central Europe are shown in the *Atlas des Deutschen Lebensraumes* for 1910 and 1930 and these maps are generalized in Figs. 15 and 16. There is a remarkable and widespread decrease in the birth rate everywhere in this period. In 1910 France, together with the Walloon and the French Swiss areas, had a small annual birth rate of less than 20 per 1,000 persons. A somewhat higher birth rate is revealed in Germany and its neighbour states. The territories in east-central Europe had the highest birth rates, in general, over 35 per 1,000—Poland, Czechoslovakia, Hungary, and in the south the South Slavs and Italians. In 1930 there is a remarkable change. The birth rate in Germany was almost everywhere the same as in France (12.5 to 17.5 per 1,000), with Bavaria still definitely on the high side. Poland still showed a very high figure with little decrease since 1910. Perhaps most remarkable is the decrease in the birth rate in Hungary and in northern Italy.

These figures may be expressed in another way. The population of Europe in 1815 was 200 millions. This had increased to 300 millions in 1870 and to 456 millions in 1925, that is, it had more than doubled. Probably the most remarkable fact about these changes in population of the individual states and peoples is that in 1815 France had 14.9 per cent of the total, whereas in 1925 the proportion had decreased to 8.3. In 1815 France had a larger share of Europe's population than Germany which had 11.7 per cent in 1815, and 14.9 per cent in 1925. In 1815 France had 30 million people as compared with only 17 million in Britain! France was the greatest Power in Europe. The changes in numbers are even more significant, for in 1925 the population of Germany exceeded that of France by over 25 millions and that of Britain exceeded France by 8 millions. Russia increased its population from 51.7 millions

The Population of the States of Europe (from H. Haufe, *Die Bevölkerung Europas*)

	1925		1815	
	(1)	(2)	(1)	(2)
German Reich	67.4	14.9	22.7	11.7
Great Britain and Ireland ..	48.1	10.6	17.2	8.6
France	40.7	8.3	30.0	14.9
Italy	37.2	8.2	18.4	9.1
Scandinavia	12.2	2.7	4.3	2.1
Balkans (with Bosnia and Herzog)	20.0	4.4	9.0	4.5
Russia	117.0	25.8	51.7	25.8
Austria	26.8	5.9	13.0	6.4
Hungary	22.4	5.0	10.7	5.3
Poland	10.6	2.3	2.8	1.4
Spain and Portugal	26.9	5.9	13.5	6.7
Netherlands	7.8	1.7	2.2	1.1
Belgium	7.4	1.6	3.2	1.6
Switzerland	4.1	0.9	1.7	0.8

Note. Germany as in 1914 without Alsace-Lorraine. Austria of the German Confederation. Hungary as in 1914. France as in 1926. Belgium as in 1914. Russia as in 1870.

(1) Population.

(2) Percentage of Total for Europe.

The Peoples of Europe (from H. Haufe, *Die Bevölkerung Europas*)

	1815		1925	
	(1)	(2)	(1)	(2)
Germans	28.0	14.0	80.0	17.7
French	29.0	14.5	43.0	9.5
English and Scotch	15.0	7.5	46.0	10.1
Scandinavians	4.4	2.2	12.0	2.6
Italians	20.0	10.0	37.0	8.2
Magyars	3.2	1.6	10.0	2.2
Rumanians	3.0	1.5	12.0	2.6
South Slavs	5.0	2.5	14.4	3.2
Czechs	3.4	1.7	7.0	1.5
Poles	8.4	4.9	20.0	4.4
Russians	47.0	23.5	113.0	25.0
Jews.. .. .	1.0	0.5	7.1	0.8
Europe	202		456	

(1) Population.

(2) Percentage of Total for Europe.

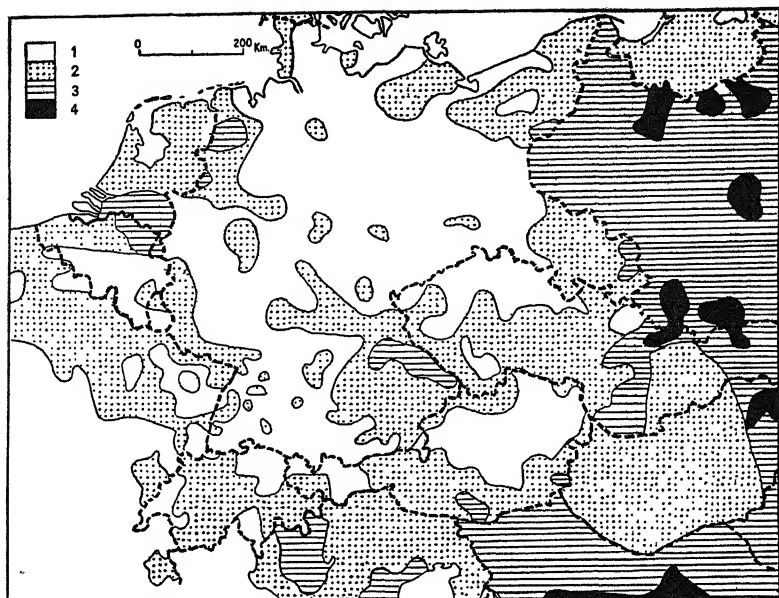


FIG. 15—CENTRAL EUROPE: BIRTHRATES IN 1930 (from *A. d. D.L.*) (scale, 1 : 12 m.)



FIG. 16—CENTRAL EUROPE: BIRTHRATES IN 1910 (from *A. d. D.L.*) (scale, 1 : 12 m.)

Per 1,000 inhabitants.

1. 17.5–12.5 and under
2. 17.5–25.0

3. 25.0–35.0
4. 35.0–37.5 and over

to 117·0 millions and the proportion of the total for Europe was exactly the same in 1925 as in 1815, one-quarter.

The numbers of the people belonging to the various ethnic groups is much more difficult to determine exactly, but such figures are available for the same dates, 1815 and 1925. They accentuate these points as based on the pre-1914 state boundaries. The Germans increased their numbers from 28 millions (14 per cent of Europe) in 1815 to 80 millions (nearly 18 per cent) in 1925. This is nearly a threefold increase. The French increased from 29 millions (14·5 per cent) in 1815 to 43 millions (9·5 per cent) in 1925, an increase of about one-half. The British group increased from 15 millions (7·5 per cent) in 1815 to 46 millions (10 per cent) in 1925, a threefold increase. The Russians, though increasing from 47 to 113 millions, made up 23·5 to 25 per cent of the total, a two and a half times increase in a vast primitive rural community. These figures indicate convincingly the problem of man-power. The rest of the Slavs and the Magyars made up 14 per cent of the total as compared with 12 per cent in 1815. In effect, the east European peoples make up 40 per cent of the total population of Europe and have increased in such numbers as to maintain their proportion of the total without industrialization. The tremendous increases in Britain and Germany have been favoured by industrialization though they have both exported large numbers of people: The Slavs effected their increase in primitive, feudal conditions. German, French, British and Scandinavians face a decline of population. The Slav states, and above all Russia, face an era of increasing industrialization and birth rates that are still high and conditions of living that are improving and death rates that are likely to decrease. This is the demographic future, and these trends will become effective in world affairs within our generation.

The demographic contrasts between western and eastern Europe will have fundamental effects on the differing culture levels of the peoples and, in consequence, on their economic and political strength. In Germany, as in the rest of western Europe, the decline of the birth rate is reflected in an ageing population and a decrease in the numbers of child-bearing women. In the three western zones of occupation this decline of the natural increase of population coupled with the great losses incident on the last World War have been offset by the tremendous and unprecedented increase of population since 1945 through the immigration of Germans from central Europe and from eastern Germany. Immigration, together with the great war losses, result today in an abnormally high proportion of women.

The problems of overcrowding and maintenance of an adequate standard of living are more acute in Europe than ever they were, even given a resumption of the same level of economic conditions of the 'thirties. The

one hope in this respect is the remarkable recuperative capacity of the peoples of western Europe, in spite of all that is said of the "decadence" of European civilization by American writers, both after World War I and, still more notably, after World War II. Within two years the volume of industrial output in the countries of western Europe has exceeded the 1938 level, though agricultural output in some countries is still under this level. Production in western Germany has steadily risen and is now well above the pre-war level. The prime problem now, however, is the great increase of population in western Germany. The northern section is primarily industrial. Large areas in the south are predominantly agricultural and pretty well self-sufficing (with, of course, local crop movements) without having any large margins of surplus for dispatch to consuming areas in northern Germany. The industrial north must produce more foods and goods and export so as to maintain its greatly swollen numbers.

CHAPTER 5

THE DISTRIBUTION OF POPULATION

THE DISTRIBUTION OF POPULATION IN 1830

THE FIRST census reports at the beginning of the nineteenth century permit us to picture the distribution of population as it was three centuries after the Middle Ages. This was the framework upon which the great changes of the ensuing hundred years were to take place. Fig. 17A shows the distribution of population in central Europe in 1815. It is a reproduction of Haufe's map from his work on the population of Europe. The so-called rural densities exclude the towns with over 5,000 inhabitants, but include over 2,000 small country towns with less than 5,000 people. It will be observed that a great belt of high density with an average of 50-80 persons per sq. km. extends from Brittany, through northern France and the Low Countries, thence through central Germany, Bohemia and Moravia to west Galicia. This may be regarded as the main belt of high population density in Continental Europe north of the Alps. A second high density belt lies in the Rhinelands, including Switzerland. Areas of moderate density (30-50 persons per sq. km.) cover large areas in the eastern Alps, in much of France, Schleswig, and the Danish islands. Apart from these areas, and the north Italian plain, which is a separate area, this great central core of high densities is bordered by areas of low rural density with less than 30 persons per sq. km., in the Alps, the areas south of the Save and Danube, and in the Northern Lowland east of the Weser.

The east-west belt begins in Flanders (120 per sq. km.) and, from west to east, it includes the lower Rhinelands, the middle and upper Weser uplands, the Thuringian highlands and the middle Elbe basin, the Erzgebirge (with a high density in the eastern section around Dresden), the north and east of Bohemia, notably the upper Elbe basin and the Sudetes mountains (80-90 per sq. km.), Moravia and west Galicia (with a well-defined limit on the upper Vistula), and an extension to eastern Galicia in the upper Dneister basin. The Rhineland belt includes the Rhine gorge itself and the flanking plateaus, notably the Siegerland (60-70 per sq. km.), and the whole of the upper Rhinelands. The latter include the Neckar basin (100 per sq. km.), Alsace and the districts on the western slopes of the Vosges, and the northeast of Switzerland.

These two belts of high density are to be related to two sets of condi-

tions. First, they include the areas of richest soils, notably the loess belt on the northern border of the Central Uplands from central Belgium to Galicia, and the rich soils and vineyards of the Rhine and its tributary valleys, the Main and the Neckar. Secondly, it will be noted that the highest densities are often to be found in upland areas, such as the Siegerland, southern Vosges, St. Gallen district in Switzerland, the Black Forest, Thuringian Forest, Erzgebirge and Sudetes. Here developed the mining industries at the end of the Middle Ages and

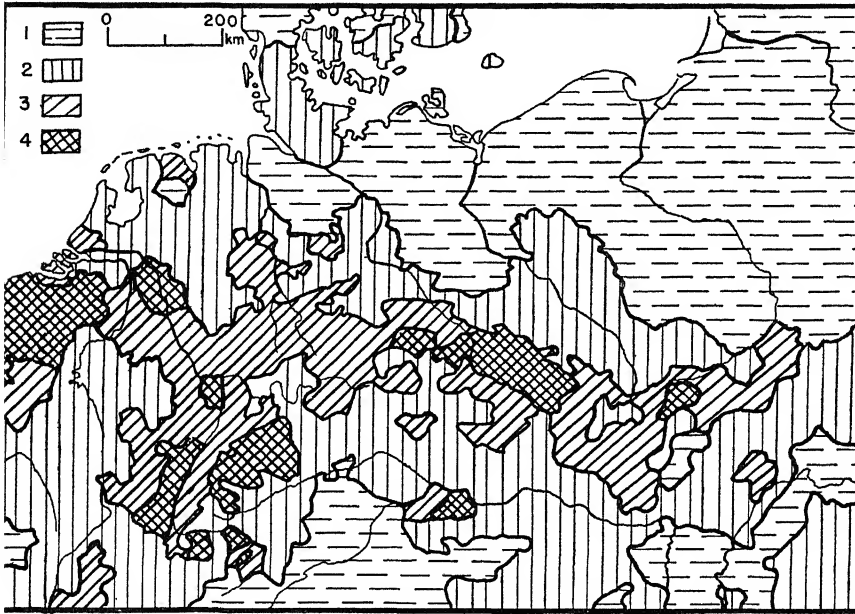


FIG. 17A—CENTRAL EUROPE: DENSITY OF RURAL POPULATION in 1815
(from *Haufe*) (scale, c. 1 : 12 m.)

Persons per sq. km. 1. Under 30; 2. 30-50; 3. 50-80; 4. over 80.

after; with their decline a change in occupations was sought by the mining communities as an alternative livelihood, and the textile industries were developed, partly by State encouragement, as in Silesia and Saxony. Until the middle of the nineteenth century these upland areas were the chief seats of industry in Germany, as they were in France and Belgium.

The towns at this period still lived in their medieval framework. (Fig. 17B.) The railway had not yet appeared and the town still served pre-eminently as a focus of trade and administration for its surrounding area and as a seat of handicrafts. The towns had much the same general distribution and size and the same functions and build as in 1500. The size of the towns with over 5,000 people was mainly a measure of their

nodal position in relation to the great water and land routes. The small towns (5,000–10,000) were fairly evenly distributed over the land. Only five in the Reich exceed 60,000, the largest being Berlin and Hamburg. When all the towns are considered, one may distinguish two main belts of greatest concentration, which correspond with the zones of highest rural density. The lower Rhineland, the Saxon *Börde*, the middle Elbe area, Silesia, and Moravia form one zone. The middle Rhineland, the Neckar basin and the lower Mainlands, and northern Switzerland, form another zone.

Towns were evenly spread over the face of the land and served primarily as centres of industry, commerce and administration for their surrounding territories. The large cities were commercial centres with a great variety of industries catering for markets beyond the limits of the local market district. They were located always on the outstanding avenues of commerce—on the coasts in good harbours (a good tenth of all cities) and on navigable rivers, especially where these were crossed by important overland routes. With few exceptions the chief cities of today were the chief historic cities, and they were among the first towns to develop in the early Middle Ages. The numerous smaller towns, with under 20,000 people, appeared in the later Middle Ages (after 1200) and had less natural nodality. They were situated at the convergence of local routes and often on sites with natural defences—hilltops, spurs, river meanders—without adequate connection with the surrounding countryside for purposes of trade. Finally, the even spacing of many small towns on main routes obviously reflects their importance as stages (German, *Rastorte*) on the great overland routes. This is particularly true, for instance, of the small towns of Hesse, which grew on the skein of routes that ran from north to south between the Rhine Massif and the Thuringian highlands. It is true also of the remarkably evenly spaced towns along the routes of Thuringia, and of those along the routes of Franconia that in the later Middle Ages radiated from Nuremburg like the spokes of a wheel.

In the seventeenth and eighteenth centuries “court cities” such as Mannheim, Karlsruhe, Kassel, Ansbach and Bayreuth were established in considerable numbers. Ancient cities appeared on the Rhine from source to mouth. Another series lies along the great west–east thoroughfares that linked Bruges, Cologne, Hanover, Brunswick, Magdeburg, Halle, Leipzig, Breslau, Cracow, and Lemberg. In southern Germany, along the network of highways that emerged in the later Middle Ages, each city shown on the map was an outstanding node of routes. Between these main routeways, however, there were relatively few large cities. They are markedly absent in the Northern Lowland of heath and marsh.

There was a marked clustering of towns with 5,000–20,000 inhabi-

tants in southwestern Germany, in Württemberg, Baden and Bavaria, and in the northern foreland zone on the border of the Central Uplands. Many of these were medieval towns that grew to be small industrial and commercial centres associated with the industrial development of the mercantile era. The great majority of towns appeared in the later Middle Ages, but these are so small as not to appear on this map. Most of these later towns did not enjoy the importance of the earlier towns as route

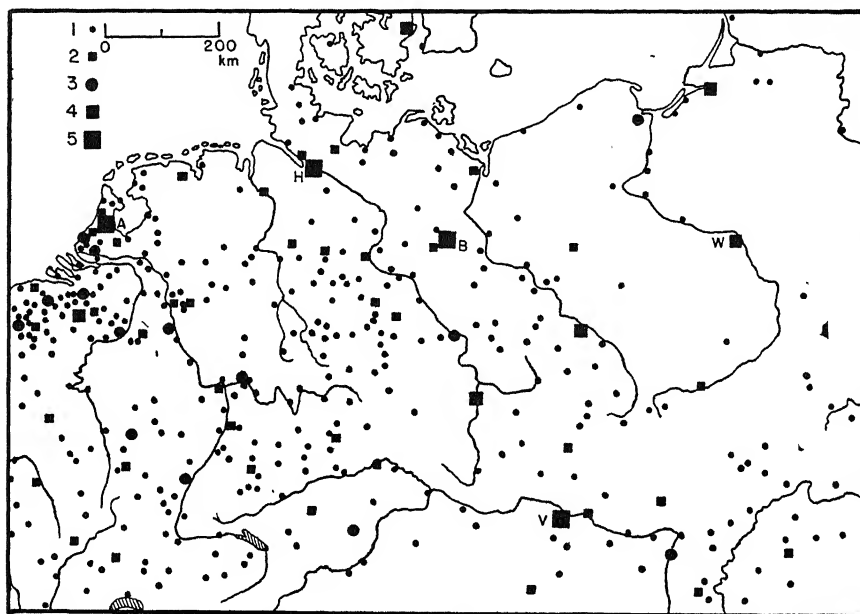


FIG. 17B—CENTRAL EUROPE: TOWNS in 1815 (from *Haupe*) (scale *c.* 1 : 12 m.)

Number of inhabitants: 1. 5-20,000; 2. 20-40,000; 3. 40-60,000; 4. 60-100,000; 5. Over 100,000.

centres. In fact, they lie at local route junctions to serve a local hinterland or to develop local mines. In addition, since many of them were founded primarily as fortresses or were sited next to castles, they were invariably placed on well-protected sites, such as a hilltop, a river meander, or a spur, and were for that reason cut off from easy contact with the country around. Many small towns established at this time have failed to function, for this and other reasons, and are today nothing more than villages. This is characteristic of many of the towns of southern Germany in Württemberg, where they have been described as "speculative failures" from the point of view of their medieval founders.

During the first three-quarters of the nineteenth century the chief seats of industry in Continental Europe were in the towns and in the

cottage and the small workshop in the Central Uplands. Such areas were the iron-working districts of the Ardennes, the Sauerland and the Siegerland; the textile-working districts of the Erzgebirge and the Sudetes; the glass- and porcelain-working districts of Bohemia and Thuringia; and the wood-working and textile districts of the Black Forest, the Vosges, and the Swiss uplands around St. Gallen. Outside these upland areas, which recorded some of the highest densities of population at this time, the Low Countries was the chief seat of industry and had accordingly high population densities. Industrial towns such as Ghent in Flanders and Amiens in Picardy had early lost their monopoly of medieval industry, through the hampering restrictions imposed by the town guilds, and in the seventeenth and eighteenth centuries handicraft industries developed rapidly in the country villages and, together with a close rural settlement in small-holdings, accounted in this area for the highest densities in Europe in 1815. The areas of greatest density of rural population were to be found in the fertile lands with well-drained, warm soils on the northern border of the Central Uplands and in the valleys of the Rhinelands. The Northern Lowlands and the Central Uplands were unsuited to close farming settlement, since they had infertile soils, and, in the latter, unfavourable climatic conditions. Farming settlement in the uplands, depending on rye, potatoes and pasture, reached to about two thousand feet. Beyond this limit the initial attraction to settlement was the exploitation of minerals and metals. And it was this fact which started the close settlement of these lands, for with the decline of the mining and metal-working in the seventeenth and eighteenth centuries, the population had to seek alternative livelihoods in new industries, the chief of which was textile-working.

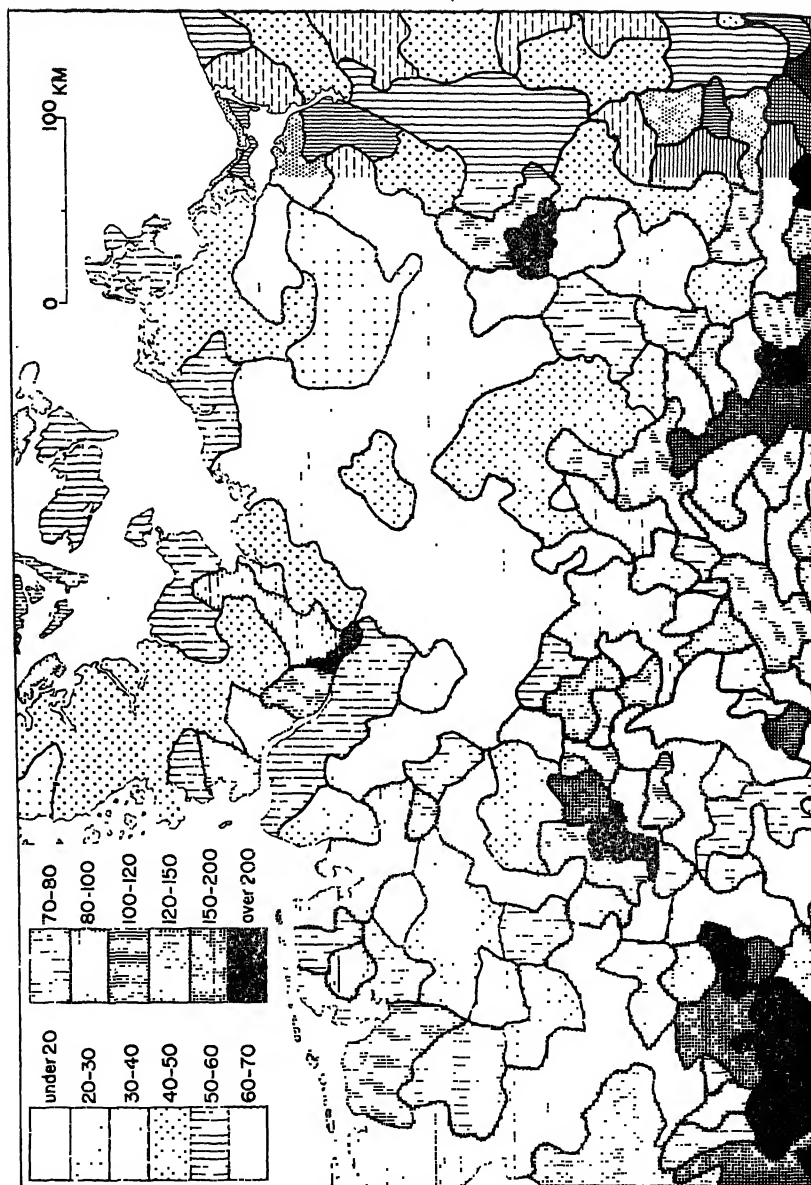
THE DISTRIBUTION OF POPULATION IN 1930

The general pattern and density of settlement in Continental Europe in 1815, which had persisted since the Middle Ages, remained until 1870. Within one generation from this date, however, a new economic and social structure based on coal and iron had appeared. By 1910 almost everywhere the factory had replaced the cottage worker and the small workshop. Within one generation the structure of society was radically transformed.

Two general points of contrast between Britain and Germany should be emphasized. The Industrial Revolution in England started in the latter half of the eighteenth century, but on the Continent the mine and the factory did not really take root until a hundred years later. The exploitation of coal and iron in England started before the appearance of the railway. Consequently we find that the factories and the furnace,

no less than the coal-pit, were concentrated on the coal-fields. There was thus a shift in population from southeastern England to the central and northern provinces. Historic cities like York and Exeter took scarcely any part in the early growth of the new industries, for the simple reason that it was far too expensive in those days to bring the coal from the pit to the city by horse-drawn wagons. On the Continent, on the other hand, and especially in Germany where modern industry appeared latest, *the railway net was virtually complete before the great industrial development took place*. This meant that the coal-fields did not exert such a strong influence on the localization of industry, except for the heavier varieties. The old seats of industry in the uplands which were far removed from sources of coal, were able to adapt themselves to the new factory conditions, partly by bringing coal by rail, partly by using running water, and, in and after the 'eighties, by obtaining power from the electric dynamo from local or distant generating stations. Similarly, the long-established historic cities which had served for centuries as the centres of the life and activity of large surrounding territories were able to continue their functions as seats of both commerce and industry—both specialized industries, seeking far-flung national and international markets, and regional industries, catering primarily to the surrounding territory. Thus, Cologne, a historic city like York, instead of remaining of medium size, has been able to share in the development of industry in the lower Rhine lands, especially of the Ruhr (facilitated, it is true, by its location, unlike York, on the great traffic artery of the Rhine). While not in the Ruhr, economically Cologne is a part of it, and its wealth helped to finance the beginnings of the new industry in the growing coal-field. Thus, historic cities which in 1815 had only some 30,000–50,000 inhabitants today reach the million mark and rank with the greatest cities in the world. As a consequence, we find that on the Continent, while there is a great and new concentration of population on the coal-fields, there is a continuity of economic development, both in the great historic cities and in the old seats of rural industry in the upland areas.

A second feature to be emphasized is that a purely fortuitous combination in the distribution of Nature's resources has resulted in the general continuity of settlement, not only of the great historical cities, but also in the general pattern of the distribution of population throughout west-central Europe. The modern culture complex of Western civilization is based on power and transport. The chief sources of power are coal, brown coal or lignite, and water. By a chance of Nature it so happens that the great coal-fields form a belt on the northern edge of the Central Uplands between and near to the populous rural land of the Loess Belt, and the thickly peopled industrial areas of the northern border of the



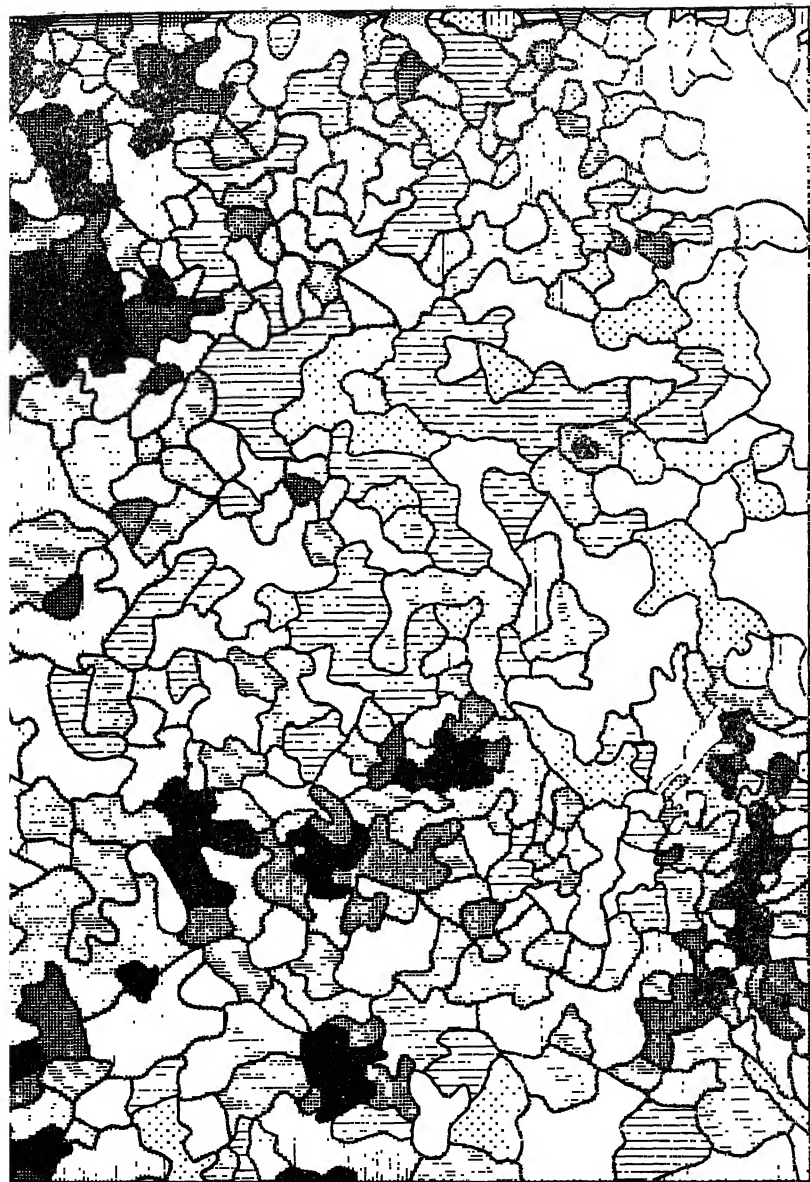


FIG. 18—GERMANY: DENSITY OF POPULATION IN 1930, EXCLUDING TOWNS WITH OVER 10,000 INHABITANTS (*from A. d. D.L.*) (scale, 1 : 4 m.) Key gives persons per sq. km.

Central Uplands. The historic Rhine lands are accessible to the modern great coal-field of the Ruhr by means of the artery of the river Rhine. Thus the modern growth of population on the coal-fields and in the Rhineland has served to accentuate the pre-industrial distribution of population, and not to cause great shifts of population belts as occurred in England.

Coal and lignite fields extend in a fairly continuous belt from northern France to Upper Silesia, and they correspond with, and indeed in part actually lie under, the loessic soils. Coupled with this is the fact that in this belt the great medieval routeways from east and west and north and south converged. Along it occur a series of historic cities which today, in many cases, have become great seats of industry and commerce. Continuity of tradition and continuity of the general settlement pattern are, therefore, characteristic of west-central Europe. This is especially true of Belgium and Germany. In France the chief seats of industry have shifted from the periphery of the Central Massif to the coal- and iron-fields in the north. But even here the development of industry in the coal-field revived many of the historic cities of ancient Flanders. In Germany, the Ruhr industrial area clustered around several historic cities, Duisburg, Essen and Dortmund. Upper Silesia and the Saar, however, are two entirely new areas of mining and industrial development and population concentration which were formerly forested and thinly peopled, although the development of the Silesian field has affected the development of the old cities of Cracow and Breslau near to it. It is owing to this combination of factors that we find in general a correspondence between the belts of high population density in west-central Europe in 1815 and 1870 and 1930. There has been a tremendous increase in the urban population since 1870, but this, by and large, is built upon the pattern of settlement distribution of 1815, though within this belt great urban agglomerations have emerged.

The highly industrial and thickly peopled areas demand both raw materials for their industry and food for their people. They require access to Continental and overseas markets. The populous areas thus form a zone of dense routes with great mobility of persons and goods. In this connection the most momentous single fact is that the zones of greatest industry and population density are situated near, on, or astride, the political frontiers. This is eminently true of the frontiers between France, Belgium, Holland, Germany and Switzerland. On either side of the frontier between Germany and Czechoslovakia, which lies in a zone of upland, there is no break in the zone of high population density from the Fichtel Gebirge to Upper Silesia. In these populous areas there is thus a close exchange of commodities, a daily and periodical flow of traffic across the political frontiers. It is especially remarkable

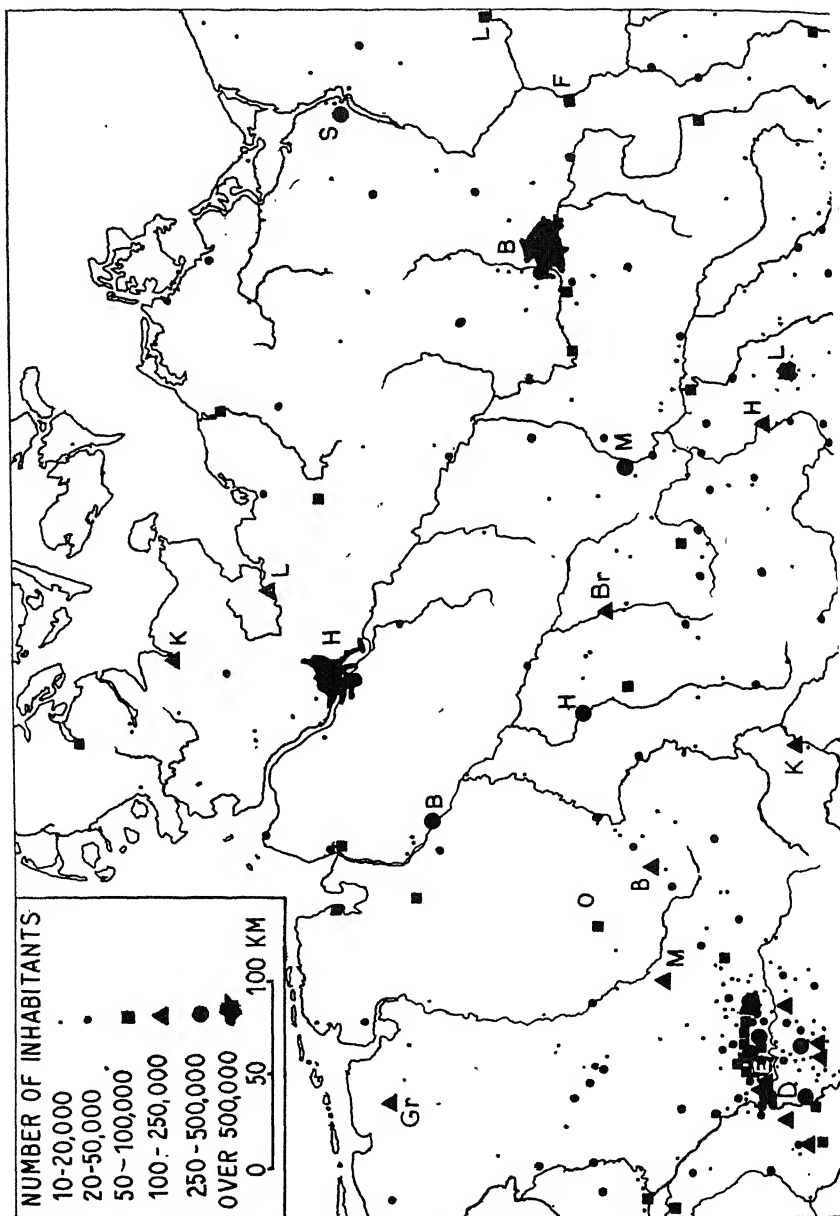
that the coal-fields of Germany lie near its frontiers, while the biggest iron-ore field in Europe, that of Lorraine, was formerly divided equally between France and Germany, but has been entirely in the hands of France since 1918.

Refer to Fig. 18, showing the distribution of rural population in 1930.¹ We note two great belts of high population density, with high concentration of urban populations. These may be termed the Mid-European and Rhineland belts. The Mid-European Belt is part of the main axis of dense population which extends from the British Isles to central Russia to which attention has already been drawn. There are three chief areas of concentration in it in central Europe: the middle Elbe basin; the upper Elbe basin in Bohemia with Prague as its centre; and Upper Silesia, which is connected with the Cracow district.

The Rhineland Belt begins with French and Belgian Flanders, includes all central Belgium (except the Ardennes to the south), western and southern Holland (except its northeastern provinces), and the whole of the German lower Rhinlands (Rhineland-Westphalia) as far south as Bonn. It is continued southwards through the Rhine gorge, where it includes the eastern part of the Rhine Massif. A great area of high density is again reached in the middle Rhinlands. This belt is continued without break into the Swiss plateau, which contains over three-quarters of the population of Switzerland, and is bounded to the south by the Alps and the Jura. The belt contains several districts of high concentration: first, central Belgium and the Departments of the Pas de Calais and the Nord in northern France, with its geometrical focus in Brussels; second, the lower German Rhinlands area, which is linked directly with the Belgian Sambre-Meuse district via Aachen, and embraces the whole of the wing-shaped depression of the Cologne Bay, with the uplands which flank it south to Bonn; third, the Upper Rhine Plain with its chief clusters in the Mainz-Frankfurt district and the district of Mannheim-Karlsruhe, and the Basel-Mulhausen district, which is directly continued into Switzerland. Flanking the middle Rhine are two other areas of high density, namely, the Neckar basin, centred on Stuttgart, and the Saar basin and the Moselle valley in eastern France. Both of these areas in eastern France are of recent rapid growth, and, a hundred years ago, were thinly peopled like the lands of the Ardennes plateau to the north and the lowlands of Lorraine to the south of them.

The distribution of towns with over 10,000 inhabitants in 1930 is shown in Fig. 19. The chief concentrations of population are on the coal-fields, the most important of which is the Ruhr area with over three millions. Others are located at focal points suitably situated for the

¹ This includes total population, less all towns with over 10,000 inhabitants each, by *Kreise* or their equivalents.



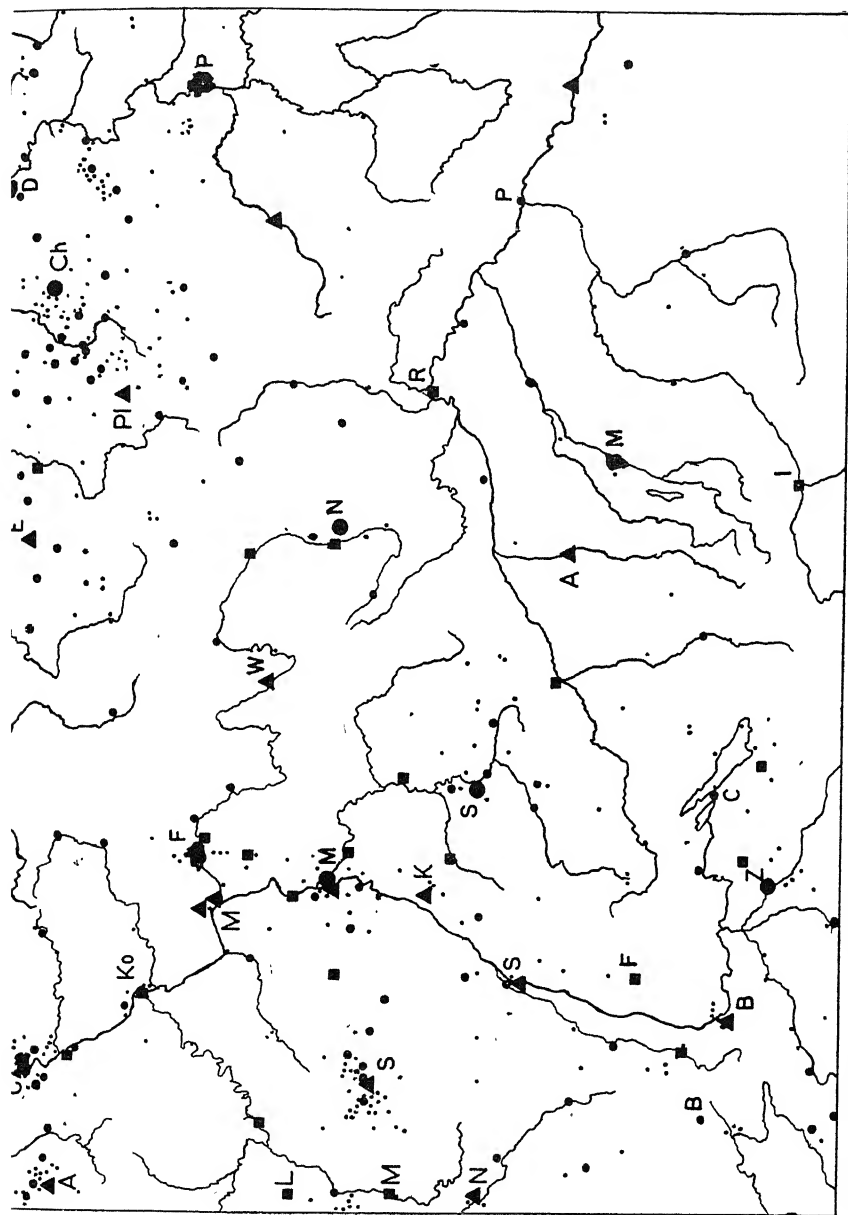


FIG. 19—GERMANY: TOWNS WITH OVER 10,000 INHABITANTS IN 1930 (*from A. d. D.L.*) (scale, 1 : 4 m.)

growth of large-scale industry, as in the middle Rhinelands; and in seats of old-established industry where further growth on modern lines has taken place, as at Augsburg, Nuremberg, and especially in Saxony. The great cities of the Middle Ages have also been able to continue to grow as seats of industry and commerce, and the ports, especially on the North Sea frontage, have developed a great variety of industries based upon the treatment of their imports and on shipbuilding. A number of smaller towns, serving definite tributary areas, have been able to increase their functions as industrial and commercial centres, like Münster, Würzburg and Erfurt. But the overwhelming majority of the small country towns with a few thousand inhabitants have invariably shown a decline. It will be observed that the main areas of concentration of towns with over 10,000 inhabitants are in the two populous belts, while in the districts of greatest concentration almost the entire population is urban in character. Outside these belts, the towns are spaced at even distances of some fifty kilometres (thirty miles) apart, except for the occasional great cities. In the whole area there are sixteen cities with over 500,000 inhabitants, and most of these, when their contiguous urban areas are included, almost reach or exceed the million mark. These are Essen and Dortmund in the Ruhr, Cologne, Amsterdam, Rotterdam, Brussels, Frankfurt, Hamburg,* Berlin,* Leipzig, Dresden, Prague, Warsaw* and Vienna,* Munich and Lille. Those marked with an asterisk have well over a million inhabitants.

Having localized the main population belts, we may now turn to the more thinly peopled areas, with a small rural density and an even distribution of small country towns. These are three in number. First, a great triangular area of medium density (100-175 per sq. mile) covers the heart of the Central Uplands, between the two populous belts, with its southern base against the Alps and its corners in Constance, Kassel and Vienna. Within this great area there are patches of higher density centred around the cities—Erfurt, Würzburg, Nuremberg, Augsburg, Munich and Pilsen. To the north of the Mid-European Belt is the thinly peopled belt of the Northern Lowlands, with a rural density over most of the German section of only 75-100 per sq. mile. Higher densities are found in the northern coastlands and in northeastern Holland. To the east in Poland, there was a very low density of population in 1871. Since 1871 the population of central Poland has increased greatly owing to a high birth rate, the absence of emigration and the development of large-scale industry. To the south, the Alps form a wide zone with a sparse population, except along the deep valley lowlands.

CHANGES IN POPULATION DISTRIBUTION, 1870-1930

The main features of the distribution of population have not greatly changed since 1871. The rural population in Germany increased by 54 per cent and the urban (with over 10,000 inhabitants) by 170 per cent from 1815 to 1870. The most notable changes in this period were the large increase of rural population of 75 to 125 per cent in the eastern provinces, due to the abolition of serfdom, the increase in the amount of peasant land under cultivation, and the development of commercialized farming on the larger estates. Similar large increases are recorded in the middle Elbe basin, where commercialized farming made great headway on the loessic soils. They also took place in the reclaimed areas of the moor and heath lands of northwest Germany and Holland. Rural population more than doubled around the newly developing industrial areas in the lower Rhineland, Saxony and Silesia. The Rhineland and Bohemia record a normal increase of some 30 to 75 per cent. These areas of normal increase include the Rhine Massif and the Upper Rhine Plain and the Rhenish Palatinate, as well as the whole of Bohemia and the eastern foreland of the Alps. Areas of actual decrease, or an increase well below the average (under one-third), are recorded in most of the Westphalian Lowland, the whole of Hesse in the upper Weser lands. The whole of southern Germany (north of the Danube between the Black Forest and the Bohemian Forest highlands) records decreases that are undoubtedly to be associated with different systems of land ownership, whether by inheritance through the eldest son or through the equal subdivision of holdings, both circumstances being a stimulus to emigration.

The period of greatest growth was from 1870 to 1925 (Fig. 20). The population of Germany in this period increased by 26 per cent on the land (total population minus towns with over 10,000 inhabitants in 1870) and by 250 per cent in the towns (with over 10,000 inhabitants). This was the period in which the people of the countryside migrated in large numbers into the industrial areas of the cities or emigrated overseas. The population of the rural areas (total population minus towns with over 15,000 in 1925) increased very little (15 to 50 per cent), or remained stationary (0 to 15 per cent increase), or actually decreased.

The most marked increases were in the large cities and other industrial areas. Outstanding are the lower Rhineland, the upper Rhineland (Frankfurt and Mannheim districts), the Saar, the western section of the middle Elbe basin (Magdeburg, Leipzig and western Saxony), Upper Silesia, Berlin, Dresden, Hanover, Bremen, Hamburg, Munich, Nuremberg, and Stuttgart.

Apart from the urban areas, there are several rural areas which record

an increase due to the extension of rural land settlement, although numerically it is quite small. These areas include the Dutch and Frisian polders, the heaths of Jutland and Schleswig, the Lüneburg heath, the moors of the northwest of Germany, and the heathlands of Veluwe of Holland, northern Brabant and the Campine. These areas stand out as a belt of increase which is all the more striking since the closely settled marsh and loess belts to the north and south were areas with a *decreasing*

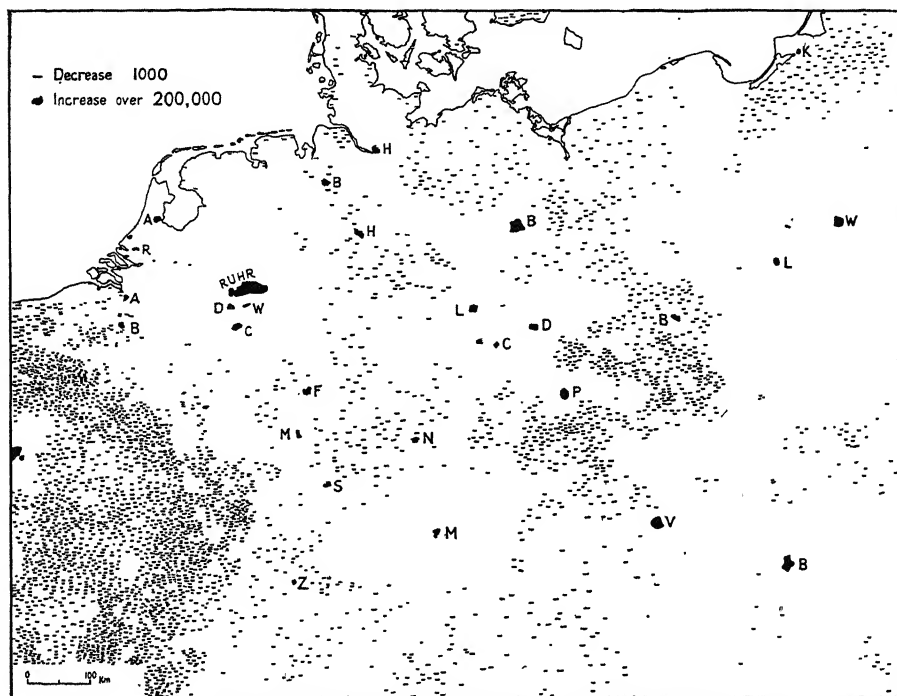


FIG. 20—CENTRAL EUROPE: GROWTH OF POPULATION 1870-1930
(from A. d. D.L.) (scale, 1 : 12 m.)

Figures based on administrative districts of the order of *Kreise*, with the deduction of urban centres with more than 2,000 inhabitants. Dashes indicate numerical decrease in rural areas, unshaded areas are areas of increase of population in rural areas. Symbols show these urban areas with increases over 200,000.

population. The reasons for this increase are varied, partly land reclamation, the mining of buried coal-fields, as in the Campine, and residential development as in the Lüneburg Heath (for Hamburg), and the Veluwe (for Amsterdam).

Large areas are affected by rural depopulation. This applies to the whole of northeast Germany—but not to the adjacent Polish areas. The latter in virtue of a continued high birth rate and small emigration to industrial areas—which is the main drain on the east Ger-

man lands—still showed a steady increase. This last feature also applies to Posen, West Prussia and Upper Silesia, which are dominantly Slav provinces. This fact is of great importance as indicative of a deep sociological difference between the Germanic and Slav peoples. While the German birth rate among the German peoples had declined as throughout western Europe, that of the Slavs has declined less and is still much higher than that of the Germans. The same is true of the Czechs, who have not only emigrated in large numbers, but have moved into the towns and to a large extent displaced the German people. All the eastern provinces of pre-1918 Germany were drained by emigration to Berlin and to the Rhine industrial areas. A large part of the Germans in the eastern provinces lost to Germany after the 1914-18 war emigrated to Germany. A total of some 84,000 people left West Prussia and Posen between 1910 and 1925.

Large rural decreases are recorded in south Bohemia and west Moravia, where the Czech population has drifted into Prague, Pilsen and the north Bohemian industrial area; whereas in Slovakia, with a high birth rate and little industrialization, the increase in the rural area is maintained. Depopulation has prevailed throughout eastern France and among the Walloon peoples of south Belgium. Within Germany itself the rural areas of the Central Uplands have declined in population. Indeed, a belt with substantial decreases includes Württemberg, northern Bavaria, Bohemia, and the Sudetes. People have moved from here to the cities and emigrated overseas. There have also been decreases in Upper Silesia outside the coal-field and in the *Börde* of Magdeburg and Halle. There have also been decreases in the Alps except for the main valley floors. The Bavarian Plateau, on the other hand, shows a slight general increase, a fact which is probably to be associated with the relatively high birth rate. Here, too, some new land was reclaimed for settlement.

Thus, within Germany we see that the chief areas of population increase are in the towns and the industrial areas, while the rural areas show a marked and positive decline in their total population, except for those areas in the Northern Lowlands and the Bavarian Plateau which have been affected by land reclamation and other factors. This German area is clearly flanked to the east by areas of moderate density from Carniola to East Prussia. Here the land has been settled for centuries and there is some sporadic industrial and urban settlement. Immediately to the east of this belt are the dominantly Slav and Magyar lands. Throughout these areas we find an increase of population; and their peoples, in spite of the long and close association of the western belt with the German real, maintain distinctive folk traits. They also have a high birth rate, which clearly distinguishes them from the peoples of western

Europe, among whom the birth rate has decreased in the last thirty years. To the west of the German-speaking areas, the French-speaking rural areas, much of Switzerland, and the western Alps, together with the Piedmont of Italy, record a large and consistent decrease of population. The Lille and Lorraine industrial areas are the only exceptions to this widespread feature.

PART III

THE HABITAT

In der Landschaft prägt ein Volk sein Geistiges und seine Schicksale ein, wie in seine Städte und Häuser. Wie die Geschlechter sich wandeln, so ändert sich auch von einer Zeit zur anderen dieses Gepräge.—Friedrich Ratzel, 1896.

¹ A people expresses itself through its landscape, just as it does through its towns and houses. As generations succeed each other, so this expression changes as time goes on.

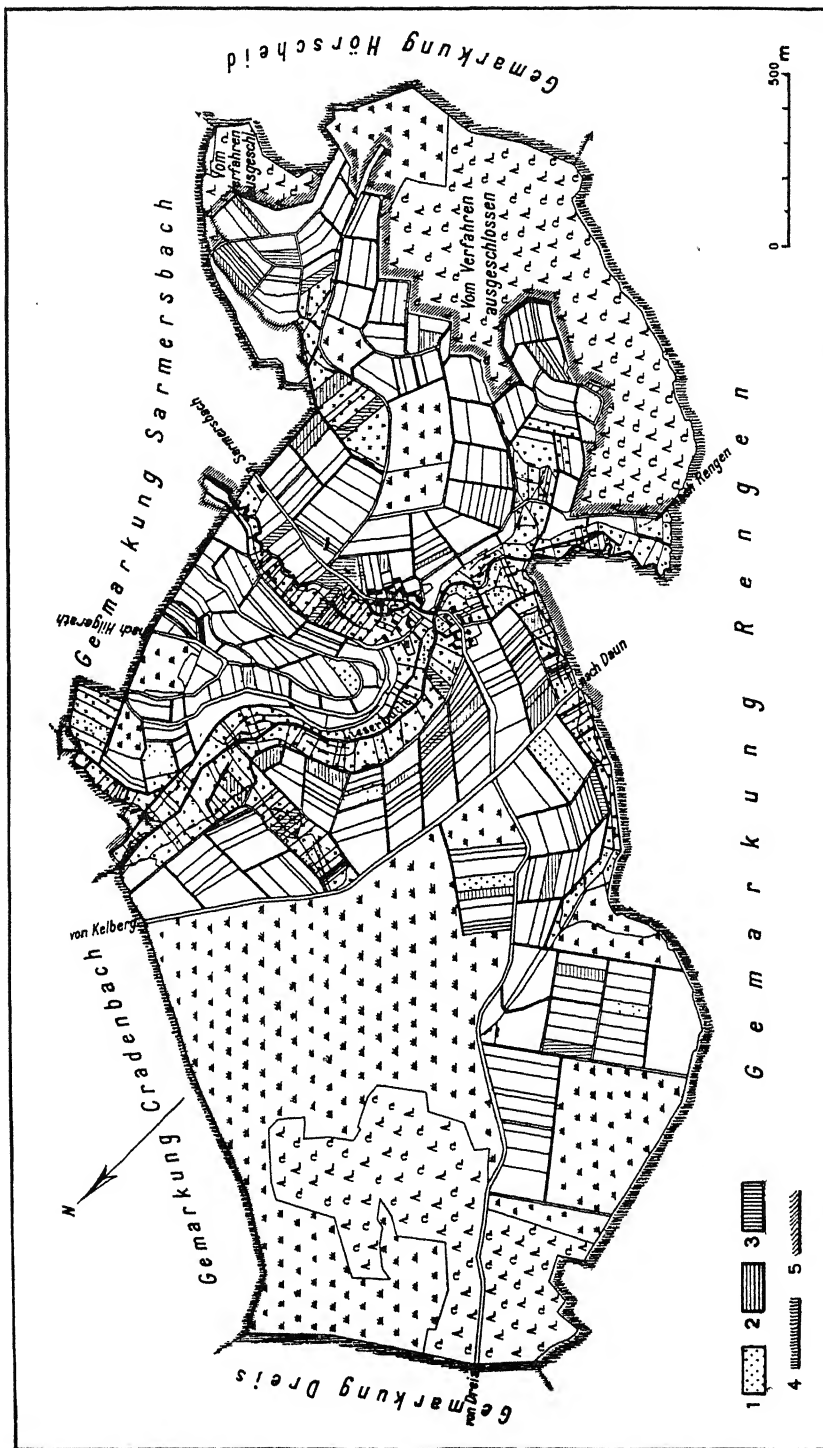


FIG. 21—EXAMPLE OF A GEWANNFLUR IN THE RHINE MASSIF

CHAPTER 6

FIELD, FARM AND VILLAGE

SINCE THE publication of Meitzen's classic work in 1895 a vast amount of research has been undertaken on rural settlements in Germany, and especially notable in recent years have been the contributions of geographers, trained in the technique of the medieval historian. Numerous documented studies of small districts and comparative studies of larger districts have appeared, and the stage has now been reached at which it is possible to generalize for the country as a whole in respect of the morphology of the rural habitat and the historical and physical factors involved in its development and regional variations.

There are two extreme types of grouping of rural settlement: the isolated farmstead, placed in the midst of its own fields, and the nucleated village, in which all of the farmsteads are clustered in the centre of the village lands. Between these two extremes, there are numerous gradations which depend upon the social and economic history of the community. The form of the rural habitat is due to the interplay of historical and physical conditions. Historical conditions are such as the date and circumstances of the origin of the settlement (whether by individual squatters or groups of settlers under the supervision of high authority), the laws of inheritance (which varied in Germany from state to state). Physical conditions are such as the relief of the land and the fertility of the soil, and the suitability of these conditions to either pastoral or arable farming, the latter in general being favourable to the maintenance of the compact habitat, the former to the dispersed habitat. The form of the rural settlement is also inseparable from the type of field system with which it is associated.

FIELD SYSTEMS

There are two distinct kinds of field arrangement in western and central Europe, the one with long, narrow strips, five or six times longer than their width; the other with compact fields, ranging from a few square

Fig. 21—(The Commune of Nerdlen, Kreise Daun, Reg. Bez. Trier) (*from Aubin and Niessen*) showing the property divisions after the consolidation of strips in 1905.

- | | |
|---|---|
| 1. Property of owner A, formerly 296 strips, now 24 | 4. Boundary of commune |
| 2. Property of B, formerly 216, now 21 strips | 5. Boundary of area affected by the consolidation decrees |
| 3. Property of C, formerly 92, now 13 strips | |

yards to many acres. The general descriptive term for the long strips in German is strip system or *Streifenflur*, and for the compact fields, block system or *Blockflur*, in which *Flur* refers to the system of field arrangement. Such terms as *Gewannflur*, *Eschflur*, *Waldhufenflur* and *Marschhufenflur*, that will be explained later, refer not so much to the system of arrangement as to the mode of economy and mode of origin of the rural community associated with the field system (*Flur*). The long strips are associated with the *Gewanne* system. Each *Gewann* or furlong contains a group of strips belonging to the peasants of the village. The *Gewanne* (of which there may be a considerable number) are grouped into three large open-fields (*Zelgen*), in which a compulsory and communal rotation of crops was adopted. This subdivision of strips becomes more minute with the continued subdivision of holdings, and this indeed may have been one of the ways in which the system developed from an initial grouping of a few farmsteads whose owners engaged in the common cultivation of their lands. It is also probably associated with the use of the heavy wheeled plough, called the *Scharpflug*, drawn by teams of oxen, for with this plough the land was furrowed in long strips so as to avoid repeated turnings (Fig. 21).

The block system is best suited to the individual farming of separate holdings (Fig. 22). It is associated in origin with lands that used the small plough or the *Hakenpflug*, the French *araire*, or the Latin *aratrum*. This simply digs into the soil, without turning a furrow. This light plough required intercrossing cultivation of the land and seems to have been associated with small, rectangular-shaped fields in lands held in severalty. This ancient field pattern is found in the uplands of Celtic Britain (seldom exceeding two acres) and was adopted in the south of France. It is characteristic of the Mediterranean lands. The enclosed fields with individual holders also developed in northwestern Europe through the disintegration of the medieval strip system with its communal cultivation, or through the settlement of individual settlers on new land. It is the system that is characteristic today of England, Scandinavia and parts of northwestern France and northern Germany. It is found throughout the newly settled lands of the New World. Both the scattered strip system and the consolidated holding were adopted in the growth of new rural settlements during the Middle Ages.

The elaborate organization of field strips of individual owners scattered in regular order in different furlongs or *Gewanne* (a *Gewann* being an area with long narrow strips arranged with the same length and common limits) around a central cluster of farms, and subjected to a communal organization of procedures in three open-fields, developed during the early Middle Ages. It was the product of a long process of evolution that certainly developed *after* the time of Tacitus, for it was

unknown to the Germanic tribes. The system apparently began to develop with the institution of the compulsory grouping of adjacent strips for cultivation, for which purpose they were surrounded by a temporary enclosure, called a *Zelge*, so as to protect the grain from the cattle. This practice seems to have appeared first in northern France in the eighth century and its development and spread during the Middle Ages was due to two main conditions: first, the introduction of the system

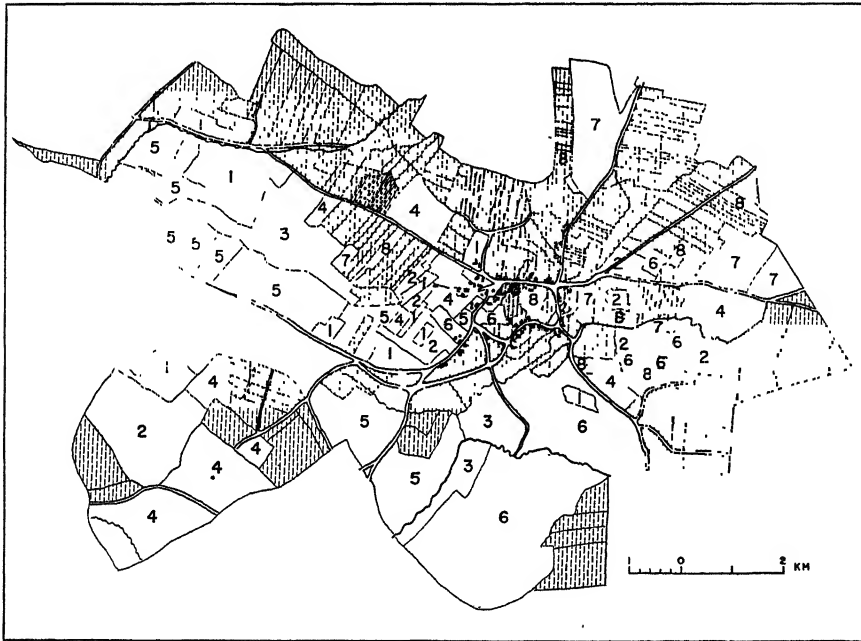


FIG. 22—EXAMPLE OF A BLOCKFUR FIELD IN SILESIA (Lalise, Kr. Militsch, Silesia) (from Ebert) (scale, c. 1 : 15,000)

Numbers refer to the properties of individual holdings, whose farmsteads are in the village. Shaded areas are scrub and heath. Unnumbered strips are additions; these are mainly clearings in the waste land.

of the equal division of property between all descendants (*Realabteilung*); and, second, the great spread of grain cultivation that took place with the growth of population during the early Middle Ages. The *Gewann* system, in other words, reflected a mode of social organization that evolved to fit the needs of a stock-raising folk that turned gradually to the cultivation of grain together with the rearing of stock—cattle, sheep and pigs.

It has been customary in modern researches to regard the *Gewann* system, with a central compact village, as revealed by the first cadastral

maps of the early nineteenth century, as something fixed in its topographic arrangement. In fact, though it appeared as a finished form in the later Middle Ages, the individual *Gewannndorf* was the product of a long process of topographic growth that can be clearly traced in the historic formation of the field patterns. This historical or genetic approach to the interpretation of the village field system characterizes recent work and has thrown new light on the whole question of the development of settlement forms.

TYPES OF RURAL ECONOMY ABOUT A.D. 1800

At the time of Tacitus the two-course system of rotation, derived, it would appear, from the Mediterranean civilization of the Romans, and temporary cropping of land for a few years following upon the burning of wood and scrub, were common throughout the German lands. The temporary, shifting cultivation gradually passed out during the Middle Ages, although it persisted in high and inaccessible places and is still practised in isolated areas such as the Ardennes. By this means large areas of forest were destroyed and their place taken by heathland and moor. The temporary cultivation of grassland was another form of cultivation that was widespread in the early Middle Ages. The land was tilled by a group for a year or so and then allowed to revert to pasture for many years. This was comparable to the Infield and Outfield system in Scotland and Ireland. The Infield was the continuously cropped land, and the Outfield contained the patches of temporarily cultivated land in the extensive surrounding heath and grassland. The practice was still carried on in the Rhenish Palatinate in the fifteenth century.

During the Middle Ages, however, the three-field system gradually developed out of these earlier systems. The system certainly does not go further back than the Carolingian era, and there seems to have developed a fairly clear geographical distinction between the areas in which the two-course and three-field systems respectively were adopted. The better wheat lands usually were used for the three-field system with a rotation of wheat, spring barley and fallow. The inferior lands had a two-year rotation of fallow and rye. In other words, the two-course system survived on the poorer soils and on small holdings and also on holdings that were worked mainly with oxen. On the other hand, the three-course system developed on the better soils on larger holdings and in areas where the horse began to be used as the chief work animal. The latter is the basis of rotations to this day over much of Germany.

During the sixteenth century the four-course system developed with the suppression of the fallow that became possible with the introduction of fodder and root crops. This change began in northern Italy and

Flanders, both closely settled areas with many towns in which the demands of the urban markets and, in Flanders, the use of night soils as fertilizers, certainly contributed to the development of farming techniques. The horse, it should be noted, was not used as a work animal until the early Middle Ages and then it was especially associated with the lands of northern Europe on its main ploughlands.

Among the additional methods of cultivation in practice in Germany in 1800, we may note in particular the practice of continually cultivating one area of arable land, with the aid of heavy manuring, with virtually no rest for fallow. An occasional year may be reserved for fallow in some areas, but the land is essentially permanently cultivated arable land. This *Einfeldsystem* involved twenty and more years in rye (in exceptional cases as many as one hundred years) without fallow, but with heavy manuring. A variant, that was not so widely practised, involved five to ten years of rye, followed by oats or fallow. A third variant, by far the most common in 1800, involved two to three years of rye, followed by buckwheat or oats in the third or fourth year. *Freie Körnerfolgen* involved the rotation of both summer and winter grains over a period of five to seven years followed by fallow. Each property owner pursued his own rotation irrespective of the rotation on neighbouring strips. This system seems to have been adapted by the Franks from the Romanized lands. The *Dreeschsystem* was a long rotation. It began with buckwheat, then, after manuring, three to four years of rye, then two to three years of oats, and finally two to three years of *dreesch*, that is, a natural growth of grass.

In distinction to these systems, there was another in which land would be ploughed for a few years and then allowed to revert to meadow, wood or heath. The ploughed land may be overgrown with grass and pastured by cattle. This is known as *Feldgraswirtschaft*.¹ Or it may be left unused and be overgrown by scrub and even woods. This is known as *Feldwaldwirtschaft*. In these practices, the common method was to burn over the land in order to prepare it for cultivation, and the ash would be ploughed in. This practice was widely followed in the "outer field" of the village community in 1800, whereas the lands near the village cluster, the "inner field", were subjected to a continuous rotation. The temporary cultivation of the outer field was known by various names, but in the Eifel it was called *Schiffelwirtschaft*. The general distribution of these three types of rural economy in the Rhine Massif is shown in Fig. 71, (p. 436).

The main crops during the Middle Ages were wheat, barley, millet and spelt, all of which were of very early origin, dating from the days of

¹ The field in grass is called a *Dreesch* (variously spelled) or an *Egarte* (in south Germany). Thus, *Dreeschwirtschaft* and *Egartenwirtschaft* are alternative terms.

Neolithic Man and the beginnings of agriculture. Rye, oats and buckwheat were later arrivals and did not become widespread until the Middle Ages. The first two appeared during the Iron Age, and became important during the Roman era, and the third was introduced from central Asia by the Mongols. Oats were grown as a spring crop and rye as an autumn crop. During the Middle Ages, owing to the shortage of manures and animal feedstuffs, livestock were fed in the forest and the heathland, on grass, mast and shrubs, and these areas within the confines of the rural community area were often more extensive than the arable lands. Beech mast was one of the mainstays of animal feed. It was not until the end of the Middle Ages that meadows began to be more intensively used. As for non-agricultural crops, flax and hemp were the chief sources for clothing apparel.

Significant changes took place at the end of the Middle Ages and during the following centuries. There was throughout western Europe, including the German Rhinelands, a gradual change from a manorial, feudal economy, to a money economy. The lords began to sever their relations with the bonded peasantry, and a free peasantry began to appear. Moreover, the landlords began to consolidate their holdings for the commercial production of corn, wine and fruits, dispensing with the peasant owners and replacing them with wage-earners. Fields were consolidated and hedged for pasture and the rearing of sheep and cattle. Thus, tenants were often dispossessed (*Bauernlegen*) and the large consolidated holding (*Gutsherrschaft*) replaced the demesne economy based on feudal relationships (*Grundherrschaft*). The cultivated land ceased to expand about 1300 and changed very little in extent until 1800. During the fourteenth century the division of holdings began in some areas, instead of all the land falling to the eldest son, so that the younger sons received smaller grants of land of five acres or less. Such a small-holder was called a Cotter, or, in German, a *Kötter*.

The farm economy of western Europe at the end of the Middle Ages was essentially a sustenance economy. Most of the arable lands, that were worked in Germany almost universally on the three-field system, were under arable cultivation, with bread corns as the staple crops, wheat on the good soils, rye on the poor soils. Rye was the main grain in north and south and was synonymous with the German word *Korn*. Cattle and pigs and sheep were pastured mainly in the woodlands, which were opened up to settlement as they were cleared, and often were overstocked and depleted in this way. The fallow land in the three-field system was also used universally for temporary common pasture. The prerequisite for improved breeding of stock lay in the care of meadow land and this did not take place effectively till the end of the Middle Ages. The three-field system was widespread in central and southern Germany. Only

in the upland districts did one find that the forest or scrub was cut or burned to make way for cropping for one or two years, then left to revert to rough growth for a period of years to recuperate its fertility. The crops grown in addition to the grains were vegetables and some fruits, flax and hemp for local cloth making, dye plants for the dyeing of cloth, and oil-yielding plants as a substitute for the olive oil of the Mediterranean and for the butter that was not yet a general item of consumption. The vine was known of course in the Roman Empire and reached the Rhinelands, but vineyards were often destroyed by the Germanic invaders. The spread of vine cultivation was taken up by the Carolingian kings in the Rhinelands and also in western or inner Germany, principally on the royal and ecclesiastical demesnes. Fruits were also known within the Roman Empire. But in the Middle Ages in northern and western Europe fruits such as apples, pears, quinces, medlars, etc., were still gathered wild from the woods. It was not until the end of the Middle Ages that the consolidation of holdings and the permanent ownership of holdings permitted the plantation of orchards that demanded fixity of tenure and continuous ownership. Although economy was mainly self-sufficing, there was local exchange of farm goods. The chief of these were corn, cattle and dairy produce, that were locally exchanged from one small producing area to another through the medium of the market town. There was also a slow development of long-distance commerce. Salt and iron were among the oldest and most essential of these items, but during the Middle Ages there grew up a trade in specialized agricultural products such as exports of wines, from Alsace throughout west Germany, chestnuts, almonds, and olives.

At the beginning of the nineteenth century the open-field system of communal cultivation was practised over most of Germany. Enclosure took place in the latter half of the eighteenth century in Denmark and Sweden, as in England, but not as a rule in Germany, where the right to combine holdings (*Verkoppelung*) was not made legal in Prussia and other of the German states until the latter half of the nineteenth century. Free agriculture with separate enclosed fields was found especially in the southwest in the pastoral areas of the Alps, the Black Forest and the Vosges, but more particularly in the fertile arable lands of the Rhine Rift valley, where maize, tobacco, potatoes, vines, orchards and hops were grown as commercial crops and demanded individual ownership and tillage. A good deal of individual farming took place also in the isolated farmsteads in the northwestern lowlands.

In the early nineteenth century there were remarkable contrasts in agricultural conditions, farming methods, and land ownership, between the older western lands and the eastern lands beyond the Elbe. In the west, the feudal system had in large measure been liquidated, and though

the peasant had to fulfill many dues to his lord, he was free of many restrictions. Forest and common land generally belonged to the village community, and dues were often commuted for rent, although the peasant was still subject to the manorial courts. In the east, however, the landowners were able to build up large estates after the sixteenth century through the expropriation of the peasantry and by the beginning of the nineteenth century there was already a large, landless peasantry. This was in contrast to the west where the peasant invariably had some land, even though, as in the upland areas, it was inadequate to support his family. The emancipation of the peasantry commenced in Prussia with Frederick the Great and became general with the edicts of 1807-8, though this enabled the Junkers to evict many small-holders from their lands and thus add to the rural proletariat. In Prussia, copyholders received full ownership of their land on surrender of one-third of their property to the lord, and all others were to cede one-half, though till 1850 all who did not possess oxen and part of the village fields were servile, so that they gradually became the landless class. West Germany profited from the introduction of the Code Napoleon before 1815; the peasants were owners and there was no big landless class.

Emancipation in eastern Germany was very tardy. In Prussia throughout the nineteenth century the manor continued to be an administrative unit under the authoritarian rule of its "squire". In the southern states, on the other hand, legislation abolishing the manorial and feudal order continued throughout the nineteenth century, and feudal services were often replaced by a quit rent. During the century much of the common land was subdivided and passed from the ownership of the commune to the individual. But legislation for the rearrangement of fields did not come into force until the last quarter of the century. The landowners in the east were thus enabled greatly to consolidate their holdings and to take full advantage of the great advances in agricultural practices in the last decades of the century. It is thus not surprising that the great rural exodus started in the 'seventies with the growth of industry in the Reich in urban centres. Sugar beet and potatoes, two principal crops in the modern German economy, became important in the early nineteenth century. The first was introduced at this time for the production of sugar, and the latter, though it had been grown for some time, increased rapidly with the new demands for pig-fattening and the production of industrial alcohol.

RURAL SETTLEMENTS IN THE WEST GERMAN LANDS

There are fundamental differences in the history of land settlement and, consequently, in the morphology of the rural habitat between the west and the east German lands.

The first areas of German tribal settlement in the middle of the first millennium of the Christian era were located in lands that, at that time, carried little or no woodland, and that had been occupied continuously from Neolithic time.

It is generally accepted that there had already been some clearance of trees in prehistoric times. Man was attracted to the loess as to other types of soil by its fertility, and by the fact that it was well-drained and easily tillable with simple implements. The above term refers to the forest-free and lightly wooded lands on the eve of the great era of forest clearance in the latter half of the first millennium A.D. The forest-free areas were also not restricted to the loess soils, but were found on other well-drained soils, as is noted below. Though pollen analysis has disproved the hypothesis of a dry Sub-Boreal phase, in which the steppe-heath (*Steppeheide*) flora entered (it was already there), and though forest clearance by felling and burning was carried on by prehistoric man, there is still no reason to doubt that these areas were still free of forest, or only lightly wooded, at the time of the settlement of Neolithic man in the west German lands. (See pp. 72-6).

Place names indicate the early phases of German tribal settlement. Suffixes indicating the first phase of German settlement are *ingen* (in Luxembourg), *hein* (in Rheinhessen), *leben* (in the Magdeburg *Börde*), *stedt* (in Holstein). A second phase, from the fifth to eighth centuries, involved the establishment of new villages near to the original ones, that included very little forest clearing. Such places bear suffixes like *hofen*, *dorf*, *hausen*. Some of the places have the suffix *weiler*, the origin of which is much disputed, but certainly derived from the Latin *villa*, and some of these places certainly succeeded Roman settlements. German scholars regard these *weiler* places as entirely new Germanic (Frankish?) settlements. The overwhelming majority lie west of the Rhine.

These first-settled lands (*Stammland*) were mainly on the loess and limestone soils, which stretch almost continuously in Germany from the Cologne Bay to Silesia; and cover large tracts of lowland and wide valley strips in south Germany—in the upper Rhine plain, the valleys of the Neckar and Main, and parts of the Bavarian Plateau. They also included smaller areas in the dry sandy heathlands of the northern lowlands. In all these areas the irregular clustered village is today characteristic, as in 1800, surrounded by its arable lands, meadows, common pastures, and woodland. (Fig. 23.) The arable lands were divided into strips (*Hufen*) and cultivated according to a time-table and usage prescribed by the village community. Beyond the arable land were the meadows and the forest. The common lands were described as the *Allmende*. This is the so-called *Gewannndorf* in which the village is named after the type of field arrangement with which it is associated. The village itself consists of a

cluster of farmsteads and other buildings, in which the streets are irregular in width and direction, and the houses irregularly disposed with respect to the street frontage and to each other. For these reasons it is called, alternatively, "clustered" or "nucleated" village or the *Haufendorf*. It is found throughout the early settled lands of western Germany, but there are important contrasts of settlement between the north and south.

(a) *Northern Germany*. The so-called dispersed or isolated habitat is today characteristic of the Northern Lowlands west of the Weser, but it extends southwards beyond the lowlands to include the northern part of the uplands of the Rhine Massif. Recent researches have made it clear that the dispersed habitat in Lower Saxony and Westphalia (and, it may be added, in the adjacent parts of the Netherlands¹) is a secondary dispersion from an original open grouping of scattered farmsteads, which formed a single community engaged in the cultivation of small patches of arable land in the midst of uncultivated heath and marsh. This settlement is now considered to be the earliest type of German rural settlement in northwest Germany and in it are to be found the beginnings in this region of the three-field system and the irregularly nucleated village (*Haufendorf*), as well as of the isolated farmstead. From the field system associated with it, this initial settlement has been called by German scholars an *Eschdorf*, and it can be studied today in many settlements which have changed very little since early medieval times. (Fig. 23.) Its centre is a portion of the common pasture (*Allmende*) called a *Brink* with oak and elm trees on it, in which, irregularly spaced at some distance from each other, are placed six to twelve farmsteads. Around this village nucleus lie the separate *Esche*, each a small furlong system (*Gewannflur*). The *Esch*² is placed on slightly raised ground, usually an elongated oval in shape, with a sand or loam soil. It was divided into long narrow strips, about 5-15 m. wide and 200-1,000 m. long, and these belonged to the farmers of the community (*Vollerben*) only. The *Esch* was sown with rye year after year, and its fertility maintained by heavy *plagen* manure, a compost of scrub from the heath and cattle dung. Through centuries of manuring, there has accumulated a soil layer with a colour at the surface of dark grey changing in depth to brown, and with a total thickness of 20-70 cm. Each *Esch* was separately hedged as a protection against cattle and formed an island of cultivation in the common mark. The latter, the *Gemeente*, was heath, swamp and peat bog, and served as common cattle pasture.

¹ H. J. Keuning, "L'Habitat rural aux Pays-Bas", *La Néerlande, Études Générales sur la Géographie des Pays-bas*, Congrès Inter. de Géog., Amsterdam, 1938, pp. 93-119.

² G. Niemeir, "Eschprobleme in Nordwestdeutschland und in den Niederlanden", *Comptes Rendus du Congrès International de Géographie*, Amsterdam, 1938, Tome Deuxième. Also Carl Baasen, *Niedersächsische Siedlungskunde*, Oldenburg, 1930, and R. Martiny, "Hof und Dorf in Altwestfalen", *Forsch. z. Deutschen Landes- u. Volkskunde*, XXIV, 5, 1926.

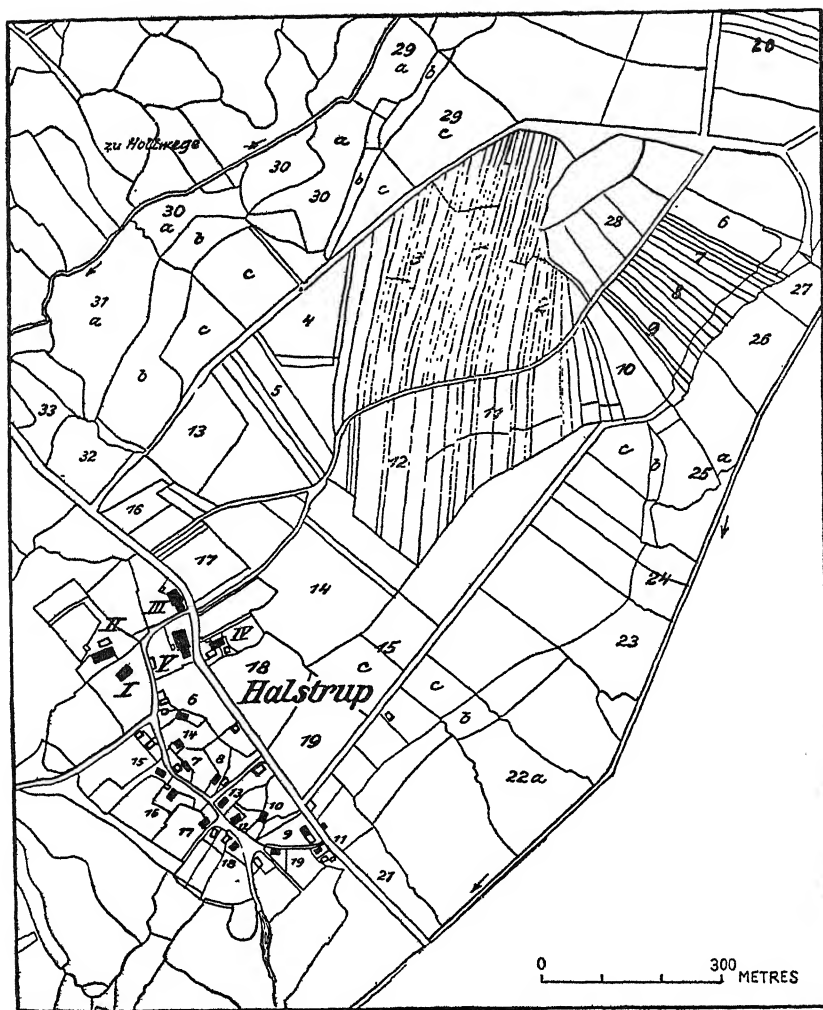


FIG. 23—EXAMPLE OF A DRUBBEL IN N.W. GERMANY: HALSTRUP
(from Baasen) (scale, 1:12,000). Plan dated 1840

This is a *Drubbel* village in the Oldenburg Ammerland. The cluster of farmsteads is adjacent to an *Esch*, that stretches from N.E. to S.W. on slightly raised ground. I to V are the farmsteads of the original landholders (*Altbauern, Vollerben*); 6 to 19 the farmsteads of the small holders (*Kötter*). The fields (*Fluren*) are numbered: 1 to 12 are *Gewanne* (groups of strips of the *Vollerben*) on the *Esch*, and the remainder are enclosed (*Kämpe*). Individually owned meadows (a), woodlots (b), and common land subdivided in the early 19th century (c), lie on the lower, ill-drained land to the N. and S. of the *Esch*.

There are serious objections to the use of the term *Esch* in settlement terminology. The word simply indicates a *Flur* of arable land. Its name is derived from Gothic and means grainland. Though the name is widely used, its exact meaning varies, for it may be used for one of the fields in a village with a fully developed three-field system, and, indeed, the method of division of an *Esch* into field strips varies widely. Consequently, the terms *Langstreifenflur* and *Drubbel* are now in general use by German scholars as more exact terms to designate, first, the nuclear section of arable land that is divided into long narrow parallel strips; and, second, the open cluster of farmsteads associated with it, the word *Drubbel* being an old popular Westphalian topographic term to describe a hamlet.¹

The *Drubbel*, as described above (Fig. 23), is to be found almost unchanged in the dry, sandy heathlands of the northern lowlands, as in the Hümmling and the Lüneburg Heath. Elsewhere, it has been transformed to give today either a compact village on the fertile soils or a completely dispersed settlement. In richer arable lands, the addition of new farmsteads and the houses of craftsmen in the *Brink* led to the reduction of the woodland and the extension of the arable in the surrounding *Mark*, and the open group of farmsteads became a compact irregular village (called by Martiny a *Haufenwegedorf*), surrounded by hedgeless arable lands. Such villages are to be found pre-eminently in the *Börde* lands on the loess soils between Cologne and Magdeburg.² (Fig. 113.) On the other hand, in the northwestern lowlands, small farmers (*Kötter* or *Kötner*) (who were excluded from property rights in the *Esch*) began at an early stage to leave the village group and reclaim new fields in the marsh and heath of the surrounding *Mark*, and here they built their farms. Such compact fields are called *Kämpe* and the settlement a *Kampensiedlung*. (Fig. 23.) The process is akin to the squatter settlement which took place in the Middle Ages in England. But in northwest Germany (and northeast Holland) it commenced in the period known as the Early German Period from the fifth to the eighth centuries, and continued throughout the Middle Ages, and was resumed after the division of the common lands in the nineteenth century. To-day, such *Kampen* settlements with their separate fields (*Blockflur*) surround the *Esch* nucleus, which itself consists of a few farmsteads, e.g. the Münsterland. (Fig. 23.) In some purely pastoral areas (as in the marshlands between the Ems, Jade and Weser) the nucleus has disappeared and in its place there are small hamlets of scattered farmsteads grouped around an occasional church village (*Schwarmensiedlung*).

¹ W. Müller-Wille, "Langstreifenflur und Drubbel", *Deutsches Archiv für Landes und Volksforschung*, VIII, Heft I, pp. 9-44.

² E. Obst and H. Spreitzer, "Wege und Ergebnisse der Flurforschung im Gebiet der Grossen Haufendörfer", *Petermanns Mitteilungen*, 1939, pp. 1-19.

The importance of the study of field systems in the understanding of rural settlement is clearly shown by a recent study of the *Gewannsdörfer* of the *Börde* of Hanover.¹ Study of the field system in these villages reveals a variety of patterns that differ as to location and age. A typical village may be examined. Regular (schematic) parallel strips and regular separate fields, both under arable cultivation, occur on the outskirts of the farmed area. Here, too, occur small, irregular, separate hedged fields, usually under grass, that were apparently clearings on the edge of the forest. These two kinds of field (regular and irregular) were the most recent additions to the farm area before the consolidation of holdings took place (*Verkoppelung*) during the nineteenth century. The greater part of the farmed area consists of irregular, short, parallel strips that occur either as separate strips or in open-fields (*Gewannflur*). These strips emerged through centuries by the extension of the farmed area around the nucleus of settlement. Though irregular in comparison with the above two, they are nevertheless systematically laid out and belonged to the *Kötner*, *Brinksitzer*, as well as to the *Voll-* and *Halbbauern*. The earliest strips, dating from the early Middle Ages, are the most irregular in shape. Long narrow parallel strips (*Langstreifenflur*) make up large areas. These belong to the *Voll-* and *Halbbauern*; the *Brinksitzer* and *Kötner* are almost unrepresented, and were therefore probably not in existence when the land was originally farmed and the strips were laid out. The name *Feld* is associated with these oldest sectors and seems to be the equivalent of the *Esch*. This nucleus was the original farmland around which clustered the groups of farmsteads, each a little apart from its neighbour (*lockeres dorf*), of the original settlers (*Voll-* and *Halbbauern*). Subsequent development led to the emergence of the isolated farmstead in the *Geest*, and to the clustered *Haufendorf* in the loess lands of Niedersachsen.

A particular problem of rural settlement is that of the abandoned medieval village or *Wüstungsdorf*. The area discussed above is an excellent example of the desertion of such settlements in favour of adjacent villages, that thereby increase in size. In this study it is shown that the field systems of the larger nucleated villages were composed of several sets of strips, which formerly were independent and belonged to smaller villages, whose inhabitants later deserted them and moved into the present village.

Particular attention may be drawn to the Rhine Massif in which isolated farmstead, hamlet and village occur, with variations from district to district that are due as much to historical circumstances as to physical conditions. In the Bergisches Land (the Wuppertal district) and the west of the Westerwald, a dispersed settlement appeared in the Middle Ages

¹ *Ibid.*

as the initial settlement in forest clearings, but, through the law of divided inheritance since the later Middle Ages and the development of handicrafts, there gradually emerged small hamlets.¹ On arable soils on limestone and volcanic outcrops—as in the eastern half of the Eifel, the Sauerland and the eastern half of the Westerwald—nucleated villages again occur, and, like the villages in the loess areas of Hesse and Thuringia, they are of Early German origin. Along the valleys there are large clustered vine villages.

(b) *Southern Germany.* In southern Germany, villages with the place-name suffix *ingen* are especially characteristic of old Swabia and southern Baden, and *heim* occurs throughout Franconia. These are the names of the earliest villages which were founded by Alemmanic and Frankish settlers and they are to be found as in northern Germany in the forest-free arable lands. The history of medieval rural settlement, however, is markedly contrasted to that of northern Germany. Daughter settlements were established near these villages, with the same field system and communal economy as the parent villages, but the village names have suffixes such as *hausen, dorf, zimmern*. They also were established mainly in forest-free land during the Early German period, before A.D. 800. After this date there began the clearance and settlement of the forest, beginning with the vicinity of the existing villages and ending with the settlement of the wide tracts of forest under the guidance of high authority. The earliest of these hamlets have suffixes such as *bach, feld, berg, brunn*; others show affinities to the Church, e.g. *pfaff, frauen*; other names show the relation of the settlement sites to the consideration of defence by the feudal lords in the later Middle Ages, e.g. *burg, fels, eck*. The whole of this period of settlement extends from A.D. 800 to 1300.

While the *Rodungszeit* in the Northern Lowlands resulted in the clearance of marsh and forest around existing villages by the local movement of individual pioneers, in southern Germany it took the form of systematic forest clearance and the settlement of whole communities under the initiative and supervision of high authority. The great forests between the areas of first tribal settlement became imperial property and the land was granted to individual landlords. In the forest settlements, the three-field system as practised in the older villages was abandoned. Each farm had several compact fields, which were intermixed with others on a block system, but could be cultivated at the farmer's discretion; but for reasons of tradition, and to facilitate defence and communal organization, the farms were usually grouped in loose clusters to form small hamlets. Occasionally in areas with sufficiently extensive patches of arable land, hamlets subsequently grew to be compact villages. But

¹ F. Steinbach, "Beiträge zur bergischen Argrargeschichte", *Rhein Archiv* I, Bonn, 1922. Also "Gewann Dorf und Einzelhof", in *Schulte-Festschrift*, 1927.

it was far more usual for the hamlet to remain intact, as in the Black Forest, but where the land was broken into scattered patches of cultivable land, or again where a pastoral economy was dominant, the hamlet gradually disintegrated, eventually to be replaced by a completely dispersed habitat. This last change has been carefully studied in the morainic lands of the Allgäu where it was facilitated from the sixteenth to the eighteenth centuries by the law of the large landowners. The process is known as *Vereinödung*.

The isolated farmstead and the hamlet are today characteristic of the eastern half of Bavaria (Upper and Lower Bavaria and the Upper Palatinate), the morainic lands of the Bavarian Plateau, the Fichtelgebirge, Frankenwald, Franconian Jura, the Keuper marl lowlands of the middle Neckar basin, the Black Forest, Vosges, Odenwald and Spessart. All these areas are still mainly forested, with isolated patches of cultivated land on flat land, in broad valley floors, river terraces, or plateau surfaces. In the Black Forest and the Vosges, the farmsteads are arranged in groups of isolated farmsteads, and one village community (*Gemeinde*) comprises several such clusters, which are strung along a road or a valley bottom, separated from each other by strips of farmland. The individual hamlets are called *Zinken*.

This mode of settlement is to be associated with the presence of numerous small patches of cultivable land, the predominance of a pastoral economy, which demanded fixity of tenure of hedged meadows, and, in certain states, with the law of undivided inheritance, which also prevented the further subdivision of single holdings. On the other hand, in the richer arable areas, the initial villages have grown in size and compactness through the addition of farmers, craftsmen and traders, particularly where the law of divided inheritance prevails. This concentration is most marked in the vine villages of the Rhine and Neckar lands.

RURAL SETTLEMENTS IN THE EAST GERMAN LANDS¹

German settlement was effected east of the Elbe and the Weser after A.D. 1200 and the German agrarian civilization was then imposed upon the more primitive culture of the Slavs. The Slavs depended mainly on cattle-raising, fishing and hunting, with a little primitive agriculture. They practised at first a shifting cultivation and their settlements were of a temporary character. The permanent settlement consisted of a group of farmsteads, closely adjusted to the terrain, but usually clustered around an irregular open place, upon which faced the farmsteads, and from which there were only two or three exits. (Fig.

¹ R. Köttschke and W. Ebert, *Geschichte der Ostdeutschen Kolonisation*, 1937.

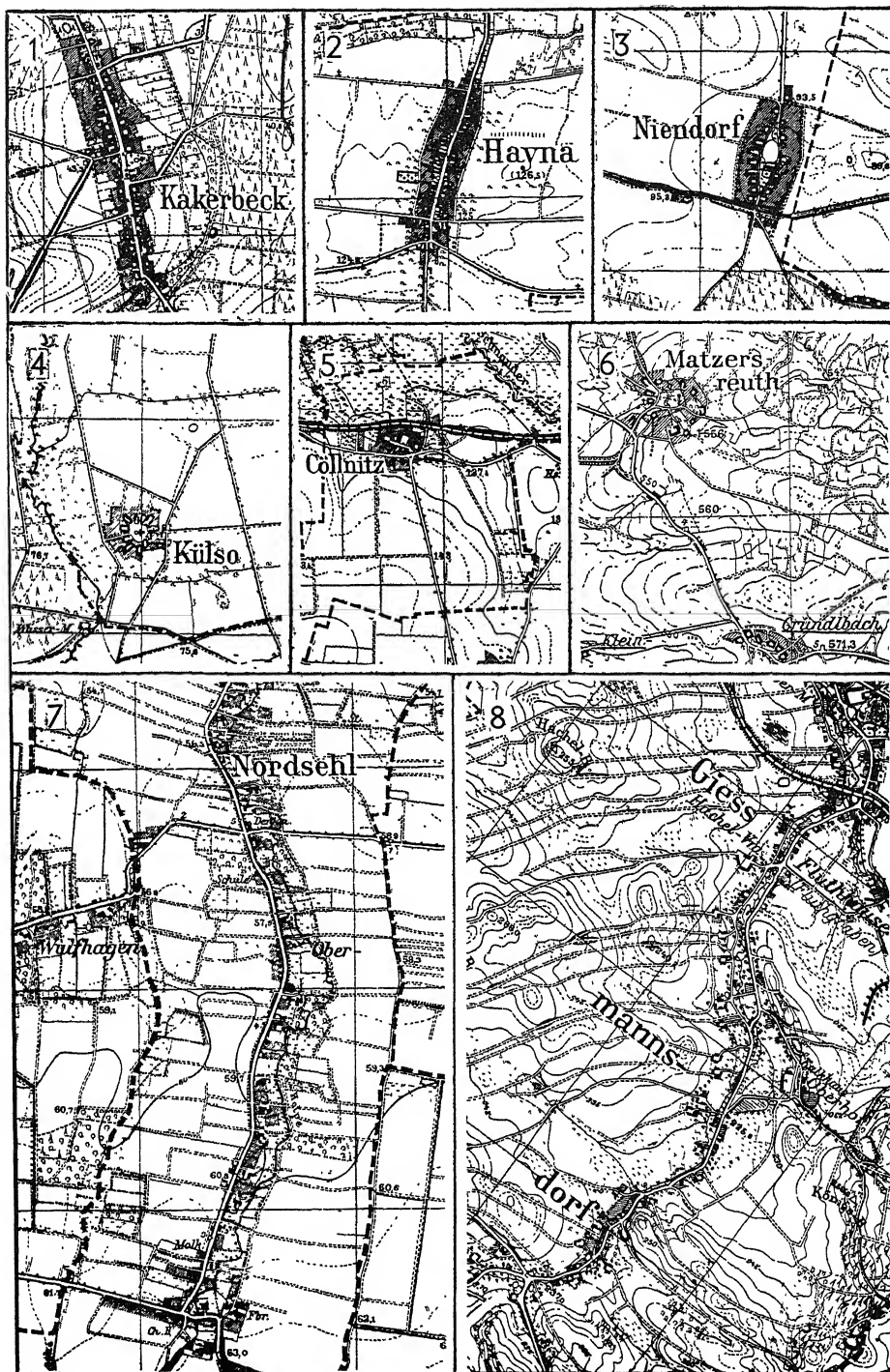


FIG. 24. VILLAGE TYPES (See p. 572.)

24.) This place was in fact an enclosure and probably served both as a defence for the folk and a refuge for their stock from man and beast. The field system was distinct from that of the German village. The arable land was divided into irregularly shaped parcels, several belonging to one peasant (*Blockflur*). The system seems to have developed by the slow accretion of cultivated parcels, and is completely contrasted to the long narrow strips of the German *Gewanndorf*. These villages were very small and the chief areas of settlement were on the loess lands and the drier diluvial platforms between the Great Valley troughs, the marsh and forest of the latter being avoided. They were sited on river banks, since the Slavs apparently did not practise the art of sinking wells to get their water. The original area of Slav settlement spread west beyond the Elbe and the Saale and, indeed, until the early Middle Ages, Slav settlement was dominant in the eastern half of south Germany, so that these small clustered hamlets are still to be found sporadically in these areas, as well as throughout the areas of German colonization.

The German colonization introduced new settlement forms into these Slav lands. Sometimes, the Slav village and its field system were left untouched (apart from the acceptance of German law), or the settlement of a few German peasants resulted in the addition of a few narrow strips to the irregular fields of the village. Frequently, the Slav field pattern was regularized and extended, and there emerged a combination of the Slav block system and the German strip system. In many cases, when new German villages were laid out, the older Slav village in the vicinity was destroyed, or gradually abandoned.

Throughout these newly settled lands there are to be found two principal German settlement forms. These are the *Gewanndorf* and the *Hufendorf*. The three-field strip system was introduced into old Slav and new German villages. While this system grew gradually in the west in each individual village, these new villages in the east were laid out systematically, and the fields (*Gewanne*) and their strips demarcated on a definite plan with a preconceived regular layout, as opposed to the piecemeal pattern of the western villages. This holds good too for the grouping of the farmsteads. The plan of the whole village was designed by a *Lokator*, who followed certain widely adopted principles of layout. The most common planned forms were the *Strassendorf* and the *Angerdorf*. (Fig. 24.) In the former, two series of farmsteads face each other in two rows on a road, which existed *before* the settlement. In

FIG. 24—VILLAGE TYPES

- | | |
|------------------------|---|
| 1. <i>Strassendorf</i> | 5. <i>Gassendorf</i> |
| 2. Simple road village | 6. Hamlet with 6-9 farmsteads |
| 3. <i>Angerdorf</i> | 7. Linear village with farms in one series |
| 4. <i>Rundling</i> | 8. Forest linear village (<i>Waldhufendorf</i>) |

the latter, the two rows of farms face a wide, long space running the whole length of the village in which are a common pond, the church, and often the cottages of landless labourers, and the outhouses of the farmsteads.

The second type of medieval field system and village settlement is found especially in reclaimed marshland and forest clearings, though it is not peculiar to such areas. In the forest village (*Waldhufendorf*) the farms are arranged as a series like beads on a chain, along a broad valley bottom or a route. The farm holding (*Hufe*) consists of one belt of land running back from the farm, to the limits of the village area, and includes meadow, arable and woodland. (Fig. 24.) The marsh village (*Marschhufendorf*) has a similar arrangement of both farms and holdings, except that it occurs in land which has been reclaimed by diking, and the farms line the dike or canal. A main feature of both these settlements is the systematic layout of the farms with consolidated holdings, as opposed to that of the strip system, associated with the three-field system of communal cultivation. (Fig. 24.) The marsh village is first heard of in the early twelfth century in the lower Weser, where it was established by Flemish settlers. It would seem that the forest village was developed from the layout of the marsh village. It occurs in incipient forms in the Odenwald and Spessart, but it is especially characteristic of the forested uplands east of the Saale and the Bohemian Forest. Transitional forms are to be found on the western border of the Erzgebirge and in East Prussia, and the same principle was used in the layout of villages in the north-eastern lowlands in combination with the three-field system. (Pl. 28 and Fig. 110.)

Among the diminutive villages of Slav origin much attention has been given to the *Rundling*. (Fig. 24.) This was a common form with many minor variants among the Slavs, though it was neither peculiar to them (since the same layout, in the interests of defence, is found throughout western Europe among early medieval settlements) nor was it common to all the Slavs. The form seems to have been regularized and copied as a unit planned settlement by the Germans (*Rundplatzdörfer*). As such it is frequent in Brandenburg and Styria. This planned form is clearly distinct from the simple Slav *Rundling*, differing from it in size, regularity and layout, social structure, and field system. It is probably for this reason that these village types are so common in the Slav-German border zone. (Pl. 1.) (Fig. 25, p. 145.)

Throughout the east German lands there are today remnants of the earlier Slav villages (as indicated by place names). These have under two hundred inhabitants, irregular forms, centred on a place or a cul-de-sac, and are surrounded by scattered, irregular parcels of cultivated land. In Mecklenburg and Pomerania the Slav settlements remain intact with place-name suffixes such as *itz*, *ow*, *thin*, though planned German

forms are scattered among them. Especially common in these two provinces are large landed estates (*Gutshöfe*) of early medieval origin, which often form a separate settlement, or the *Gutshöf* is surrounded by a group of labourers' cottages to form part of a larger village. These *Gutshöfe* were founded by German landowners at the invitation of the Slav rulers.

POST-MEDIEVAL RURAL SETTLEMENT FORMS

New areas to be brought under cultivation in the sixteenth to the eighteenth centuries differed in the eastern and western lands. In the eastern lands villages were founded, notably by Frederick the Great, on the floors of the Great Valleys. They have the same general plan as the marsh villages but were much more rigidly laid out. Large estates (*Güter*) were built up by the Junkers in this period east of the Elbe. In the middle Danube lands, German villages were laid out on a rectangular plan. The village had a central rectangular market place, and the fields were divided at right angles by earthen tracks, and the farmers had several scattered parcels, each directly accessible from the tracks. In the western lands, the consolidation of holdings took place in the areas particularly suited to cattle farming as in the Allgäu; and *Kampen* farmsteads continued to appear in the Northern Lowlands. Especially important were the establishment of new settlements (*Fehnkolonien*) in the fens and peat bogs of the Northern Lowlands.

At the end of the eighteenth century there came great changes in rural life and organization, which, however, were in general tardy in their legal enactment and still slower in their effect on the countryside. The consolidation of holdings (*Verkoppelung*) has not gone far, and, by and large, there has been no radical change in the strip system of the open-fields. The common lands in the northwest were divided and isolated farmsteads became even more widespread, but this did not take place in southern Germany. Much enclosure took place in the pastoral areas of the Baltic, where hedges are known as *Knicks* and the countryside a *Knicklandschaft*. (Pl. 18.)

The contrasts in the rural landscape between western and eastern Germany are accentuated by the social and economic developments of the nineteenth century. Free agriculture with enclosed fields was frequent in western Germany, but the communal village system was still dominant, although the peasants were free of many feudal dues. In eastern Germany, the growth of the large estate under the control of the large landowner or *Junker* was enhanced by the emancipation of the peasantry in 1807, since this justified the Junkers' eviction of the landless peasant, for all peasants who did not possess oxen and a share in the village fields

were evicted. In the west the peasant had more protection of his legal rights, and here too the French Code Napoleon had been introduced. The enclosure movement, that completely transformed the countryside of England and produced similar effects on Sweden and Denmark, had little effect on Germany. The rearrangement of fields was not permitted by law in the German states until the middle of the nineteenth century and after, and even then little advantage was taken of this new decree.

THE CLASSIFICATION OF RURAL SETTLEMENTS

We may now sum up the present distribution of village types according to their form and size, according to the recent work of Walther Christaller. (Fig. 25.) *Isolated farms* are dominant in northwest Germany west of the Weser, and north of a line through Düsseldorf and Paderborn together with, to the south of this line, a large area in the northeast of the Rhine Plateau east of the Rhine. They also occur in the Alps, Bavaria, central Franconia (the Keuper marl lowlands), the Black Forest and East Prussia, though in all these areas they are intermixed with small hamlets with 15-70 inhabitants each. Small villages, with 70-200 inhabitants, dominate in the Northern Lowlands between the Weser and the Oder, the eastern half of south Germany, the Alpine Foreland, and East Prussia. The normal village (called by Christaller the School Village) with 200-600 inhabitants, as the name indicates, is the normal size of the German village; it is very widespread. The large villages—the Church Village (*Kirchdorf*) with 600-1,600 inhabitants, the Market Village (*Marktdorf*) with 1,600-4,500 inhabitants, and the Urban Village, with over 4,500 inhabitants—are especially characteristic of the rich open arable lands in the Rhine lands, the lower Main and the Neckar basin, the middle Elbe as far as the Thuringian Uplands, the Erzgebirge (where they are mainly industrial settlements), and parts of the *Börde* land on the northern edge of the Central Uplands.

The full classification of the form of the existing settlements submitted by Christaller is as follows. A simplified classification is used in Fig. 25.

1. *The Irregular Clustered Village (Haufen- or Gewannndorf)*.
 - (a) In the old *Volksland* (the initial areas of German tribal settlement) of lower Saxony (Niedersachsen); the north of each of Westphalia, Hesse and Thuringia; and Schleswig-Holstein.
 - (b) In the areas of early medieval settlement in south Germany and the Rhineland.
2. *Isolated Farmsteads (Einzelhöfe)* appear:
 - (a) irregularly scattered, e.g. Münsterland;
 - (b) in groups around a village nucleus (*Schwarmensiedlung*), e.g. Osnabrück district;
 - (c) in linear arrangement, along routeways (*Kettendörfer*).

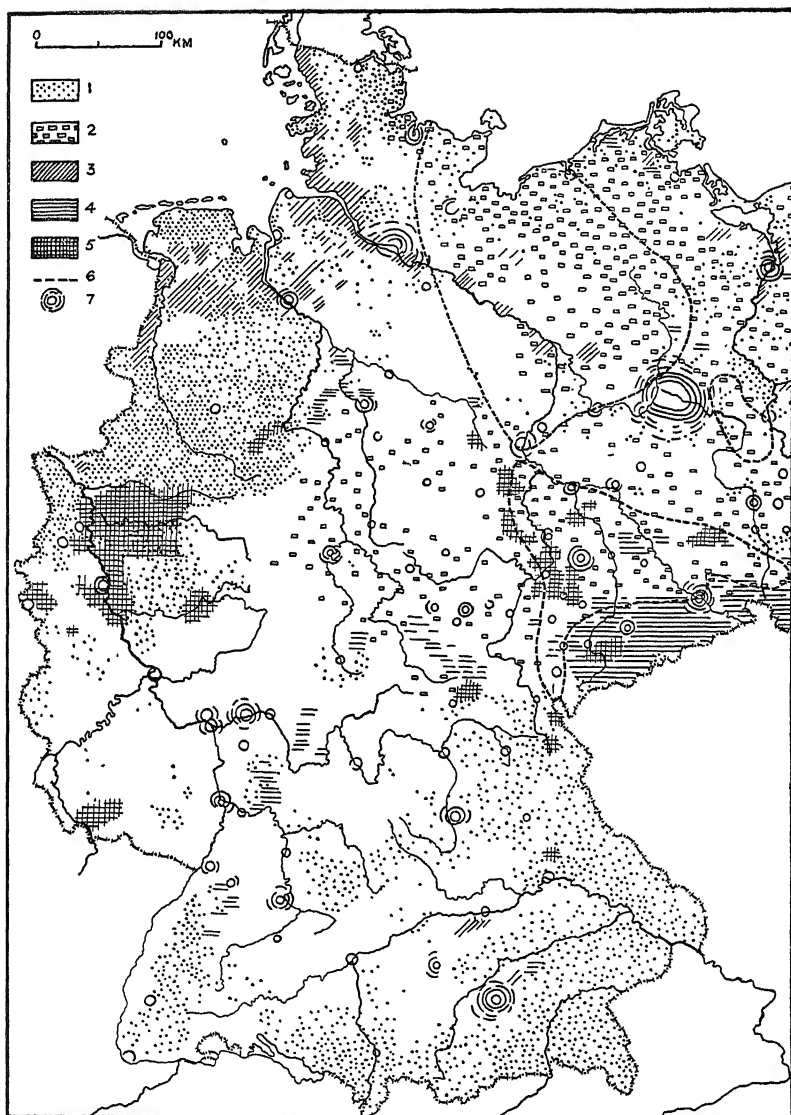


FIG. 25—GERMANY: RURAL SETTLEMENT TYPES (after Christaller)
(scale, 1 : 6 m.)

- | | |
|--|--|
| 1. Dispersed farmsteads | 5. Irregular settlements in industrial urban areas |
| 2. Estate farms (<i>Gutshöfe</i>) | 6. Extent of the <i>Rundling</i> village |
| 3. Linear settlements: <i>Marschhufendorf</i> and <i>Moorkolonie</i> | 7. Sub-urban areas |
| 4. Linear Settlements: <i>Waldhufendorf</i> and <i>Strassendorf</i> | |

In the unshaded areas, the irregular, compact village, with a field-strip system, is dominant (*Haufendorf*, *Gewannndorf*).

3. *Hamlets (Weiler)*:

- (a) founded by landlords in forest clearings in south Germany;
- (b) grouped around large estate farms (*Gutshöfe*) as in Mecklenburg; or
- (c) emerging through the continual subdivision of holdings (*Erbsiedlung*) in areas with dispersed farmsteads.

4. *Place Villages (Platzdörfer)* or *Rundlings*, the primitive Slav settlements of the early medieval period.

5. *Angerdörfer*, the chief village type in the east German (colonized) lands.

6. *Street Villages (Strassendörfer)*, the name being used only for those villages which were founded on an existing route; these are widespread in the Slav lands.

7. *Linear Villages* are similar to the villages of groups 2 (c) and 6, but in origin are fundamentally different. They include:

- (a) Marsh Villages (*Marschhufendörfer*);
- (b) Forest Villages (*Waldhufendörfer*), including *Hagendörfer*;
- (c) Fen Colonies (*Fehnkolonien*); and
- (d) Estate Settlements (*Gutskolonien*).

8. *Estate Villages (Gutshöfe)*, both isolated and in combination with villages as in Mecklenburg.

9. *Urban Villages*, especially mining and industrial settlements.

10. *Suburban Settlements*.

11. *Modern Industrial Settlements*.

W. Ebert, an economic historian, has classed the settlement forms, with special reference to those of eastern Germany, as follows.

Group I. Estate Settlements (Gutssiedlungen), that is, large estate farms, hamlets and small villages, which are mainly clusters of labourers' cottages.

Group II. Small Forms, that is, all diminutive forms with a central open place (*Gassen, Sackgassen, Weiler, Rundweiler, Rundling*). Among these there occur Estate and Dispersed Settlements where there has been consolidation of holdings (*Vereinödung*).

Group III. Fully developed, closely built-up forms (Grossformen). These include street villages and all kinds of place villages (*Platzdorf*). In some areas these types are mixed with dispersed farms, as in East Prussia, owing largely to consolidation of holdings.

Group IV. Linear Villages (Gereihete Dörfer). These fall into four types as follows:

- (a) One- and two-sided Linear Villages.
- (b) One- and two-sided Linear Villages after the style of the north German marsh villages, sometimes intermixed with dispersed settlements.
- (c) One- and two-sided Forest Villages, often intermixed with dispersed settlements.
- (d) Chain Villages (*Kettendörfer*), often intermixed with dispersed settlements.

Group V. Dispersed Settlement (Streusiedlungen).

Group VI. Colonial Settlements, after the style of the preceding village types.

With regard to the field systems, though the same system occurs in different village forms, compact "block" systems are associated with the *Gut* settlements; the block system, blocks mixed with strips, and the *Gewanne* system are associated with Group II; the *Gewann* system with Group III; *Hufen* holdings with Group IV; and single fields with *Einödfuren* with Group V and Group VI.

There is need for a standardization of classification and cartographic representation, to permit wider comparisons, on map scales of 1:200,000. To this end a committee under the direction of Professor R. Kötschke was established under the auspices of the *Amt für Landeskunde*, and its proposed schemes have been published by the *Amt* to serve as a common denominator in such studies, without in any way attempting to force the great variety of local variations into a stereotyped formalism.¹ It is suggested that field systems be shown in four colours and settlement forms in black. Field systems fall into four main categories, namely, *Blockflur*, *Langstreifenflur*, *Gewannflur* and *Gereichte Hufen*. These may be translated as:—compact field system, long-strip system, furlong or open-field system, and compact strip-holding. There is allowance for a number of intermediate and mixed categories, as, for example, the combination of long-strip (*Langstreifenflur*) and compact field (*Kampflur*) that is common in northwestern Germany. The *Einödfur* is shown in violet colour through the combination of the blue and red that are used for *Gereichte Flur* and the *Blockflur* respectively. The scheme is based upon the actual layout of the cultivated strips, and only in one case is a functional trait considered and separately mapped, namely, the *Gutshof*. Recent schematic forms in each of these categories (most of which have appeared since about 1700) are indicated separately.

Villages are divided into the following main categories: the *Haufendorf*, or compact irregular village; the *Weiler* or hamlet, including the *Altweiler* or *Drubbel* and the *Rodungsweiler* or *Ausbauweiler*, that is the settlement that resulted from forest clearance or the extension from a nuclear village; the *Einzelhof* or individual farmstead; the *Strassen-* or *Angerdorf*; the *Gassendorf*; the *Zeilerdorf*; the *Wegedorf*; the *Reihendorf*; *Platzdorf*; and *Gutshof*.

The rural settlements of today are clearly the product of a long process of development and change associated with changing social, economic, political and legal conditions, and beginning with very obscure origins. They differ also in accordance with physical conditions, and it is clear that their origins and development vary from one region to another. This genetic or historical approach affords a basis for the interpretation and classification of rural settlements today according to their size and

¹ A. Krenzlin, "Die Kartierung von Siedlungsformen im Deutschen Volksgebiet", *Berichte zur Deutschen Landeskunde*, 3 Band, 3/4 Heft, 1943, pp. 259-66, two maps.

grouping. Such classifications, as in parallel studies of land forms, are not empirical, but are based on the selection of significant groupings viewed in the light of their origin and development. There are many such classifications, and these differ considerably one from the other. What one seeks is not an overall classification, which is quite impossible, but an appreciation, based on thorough painstaking studies of small areas, of the historical processes that have resulted in the groupings we find today. The study of settlements is approached, as the study of land forms, on the basis of structure, process and stage, recognizing that these processes, and in consequence the settlement forms, vary from one area to another.

THE FARMSTEAD

The farmstead is studied by the geographer as the nucleus of the economy practised on the farmer's holding. It consists of one or more buildings, built either as one of a group of farmsteads in a more or less compact settlement or as an isolated farmstead in the midst of, or near, its own fields. The internal structure and the mode of grouping of the buildings, in terms of the needs of the particular economies with which it is associated, are conditioned by the type of building materials available for constructional purposes in the environs, by the traditions of skilled architectural crafts through which styles are transmitted and conserved by tradition in one place and by culture contacts from one place to another. In other words, the house, be it a farmstead, a country residence, or an urban house, is a culture form with definite structural features and architectural peculiarities. But the structure of the farmstead also depends, above all, on the demands made by the kind of farming pursued by the farmer, for the farm unit is the nucleus of his economy and must conform to and be adapted to its needs. It is this characteristic of the farmstead that is of special significance to the geographer. From this point of view, the farmstead, like all other buildings, has certain main characteristics, namely, its ground plan, its roof type, its side or wall structures, its building materials, the internal structure of the building or buildings, and the way in which they are grouped together. The origins of house forms are lost in obscurity, but the permanent structures that survive today, or that formed the definite precursors of those of today, emerged after the end of the Middle Ages, especially during the fifteenth to the eighteenth centuries.

By far the most important feature of the farmstead to the geographer is the arrangement of the separate farm buildings in terms of their particular uses. Starting on this basis, geographers have classified farmsteads and examined their distribution and their relations to physical environmental conditions, to the conditions of rural economy, and to culture

contacts and culture traditions. W. Müller-Wille, a German geographer, has attempted a systematic classification of farmsteads in terms of the possible groupings of the separate buildings and their internal structure. He gives special emphasis to the relation of the dwelling, i.e., the farmhouse, to the other buildings—stalls, stables, barns, and cartsheds. Within Europe he recognizes three basic forms: the Unit Farmstead or *Einheitshof*, the Group Farmstead or *Mehr- or Vielbauhof*, and the Clustered Farmstead or *Sammelhof*. The Unit Farmstead has all its rooms under one roof. The Group Farmstead is a group of entirely separate buildings, with the dwelling separate from the economic buildings. The Clustered Farmstead, though often appearing to be a Unit Farmstead, actually consists of several buildings built alongside each other.

The Group Farmstead falls into two series, an irregular and a regular series. The first corresponds to the *maison en ordre lâche* of the French geographers. It was formerly very widespread, though it is limited today, in general, to northern Europe, the Alps and the Balkans. It also occurs in Germany in the Lüneburg Heath and in the lower Rhinelands. The dwelling and the stables are often combined under one roof as in western Europe, and the dwelling and the granary (*Wohnspeicher*) are combined in the farmsteads of north and east Europe, and, in modified form, in parts of the Alps.

The regular series has a variety of groupings but all the buildings are clustered around a yard (*Hofplatz*). The type with two parallel buildings is very common in Scandinavia and east Europe. It normally has a combination of dwelling and barn under one roof, with the stalls as a separate building. More commonly in western and central Europe the buildings are arranged at right angles to each other around a yard, but there is a marked distinction according to whether the buildings are actually adjacent to, or stand apart from, each other. In the latter case, the buildings are independent and neither the roofs nor the eaves are concordant. There is, however, both continuity and concordance in the former; this is what the Germans call the *Kanterhaus*. Thus, we have a possible, and an actual, variety of types built up on two, three or four sides of a central yard or enclosure.

The structurally separate buildings of the Clustered Farmstead may be grouped together in different ways. One form is the alignment of two or more buildings, either with their gable ends contiguous, or with their long eaves sides contiguous. Other groupings are the so-called T form and the cross form. Important farmsteads, such as the Frisian type, with separate sections under one roof, may be considered, according to their structure and arrangement, as either unit or clustered farmsteads.

The Unit Farmstead is fundamentally contrasted to the other two. All the rooms and the dwelling are under one and the same roof. The

single-roomed structure is the most primitive type. In fact, however, it occurs in exceptionally large and highly developed types from a constructional point of view. There are two main and quite different types. In one type the dwelling is on the ground floor with the "economic spaces" next to it, or sometimes with barns above it; while the other type has the "economic spaces" on the ground floor and the dwelling is on the upper floor, approached by a staircase. The latter, called by the French *la maison en hauteur*, is widespread in the Mediterranean lands, in southern France and in the southern Alps. In the former type, the building has one floor, and dwelling and economic rooms are adjacent. In such cases, the building may be divided transversely (at right angles to the gable) or laterally (parallel to the gable). Transverse arrangement is characteristic in north and east Europe as well as in upper Germany and in Alsace Lorraine, the last area having a very well-developed and distinctive type. It also occurs in various parts of the west of the Rhine Massif and in the Vogelsberg. The lateral arrangement often has prolongation of the roofs to form lower partitions on each side that can be used as stalls.

Most of these farmsteads did not develop fully until after the Middle Ages and their origins are obscure. But it is clear that they are at least related to the farming economy. Thus, the large unit farmstead is probably best suited to a pastoral economy, and the grouped farmstead with a central yard with an arable economy. The small unit farmstead is also very characteristic of small-holdings with a mixed economy. The storied type is characteristic of the economy that depends primarily on the vine and the orchard and has a very small amount of arable land and few, if any, cattle and a few goats and sheep and little farming apparatus. The cellar is used primarily for storage. The unit farmstead is also not unrelated to climatic conditions for it is particularly developed in northern Germany and in the Alps where much is to be gained by living under one roof during the long, cold or wet winters. But this explanation is quite inadequate. A further contributing cause lies in demographic conditions and the influence of building techniques and building materials and traditions. Thus, timber and half-timbered work would encourage the building of separate units as protection against fire, while the use of stone would encourage the clustering of buildings in more compact form. Moreover, there is the important factor of culture contacts and the transmission of ideas of building and styles. The practice of families living together, as in the Mediterranean lands, often resulted in separate dwelling units being added to a parent building, and separate quarters for the old parents had to be built.

The farmstead, then, is the individual unit of rural settlement, and its structure depends on local building supplies, rural economy, social

tradition, and culture contacts. In these respects, there are basic distinctions between the farmsteads of eastern (Slav) Europe, the German lands, and the Romance lands in France and Italy. These distinctions are most marked against the Slav and Italian culture areas. In the latter, the stone house, with flattish roof, several storeys and few windows, suited to an economy of viticulture rather than plough and stock farming, is characteristic. The Slav house, borrowed by the Magyars, is a simple single-roomed house, akin to the Russian *isba*. It is a small rectangular building, made of timber, with a straw roof and an open fireplace in the centre of the room; often the cattle are stabled in the same building, although several small buildings may form together a scattered irregular group. This is the kind of house and scattered hamlet which is found throughout the Baltic provinces and among all the Slav peoples on the German borderland.

Within the lands of German settlement, however, there are far more significant variations in the type of farmstead. (See Fig. 26.)

In the German lands the farm types developed in the Middle Ages. They appear first in the folk areas of western Germany and then some of them were transferred by the emigrant folk to the new lands of colonization where they were modified according to the nature of the farming, the available building materials, and developments of style. Three main farm types may be recognized. The Low German house (*Niederdeutsches Haus*) is found mainly in the Northern Lowlands. The Middle German house (*Mitteldeutsches Haus*) is found throughout the northern section of the Central Uplands. The Upper German house (*Oberdeutsches Haus*) is found in the south German lands. Each of these has sub-types, which have developed under special conditions.

The Low German house (Fig. 26) in its simplest and basic form is a unit structure, with a single vast steeply sloping roof, supported by two rows of timber uprights (*Ständer*) and cross-beams or stays (*Kehlbanken*). It is a *Ständerhaus*. It has no second storey. The floor is subdivided to form a great central threshing floor (*Diele*) between the uprights, beyond which, under extensions of the roof, are the stables for the cattle (*Kübbungen*), while at its far end are the living-quarters (*Kammerfach*) with a central open hearth (*Flett*). The entry to the *Diele* is by a great gateway at the gable end of the building. The introduction of the fireplace, oven and separate living-rooms were innovations of the Middle Ages and, together with adaptations to farming economy, caused modifications in this initial structure. The two main variants are the Frisian and the Saxon houses. The Frisian house is very localized on the raised mounds in the northern marshes, and is especially adapted to cattle farming. The building is centred on the *Diele*, here called the *Gulf*, and the rooms and stables are grouped all around it.

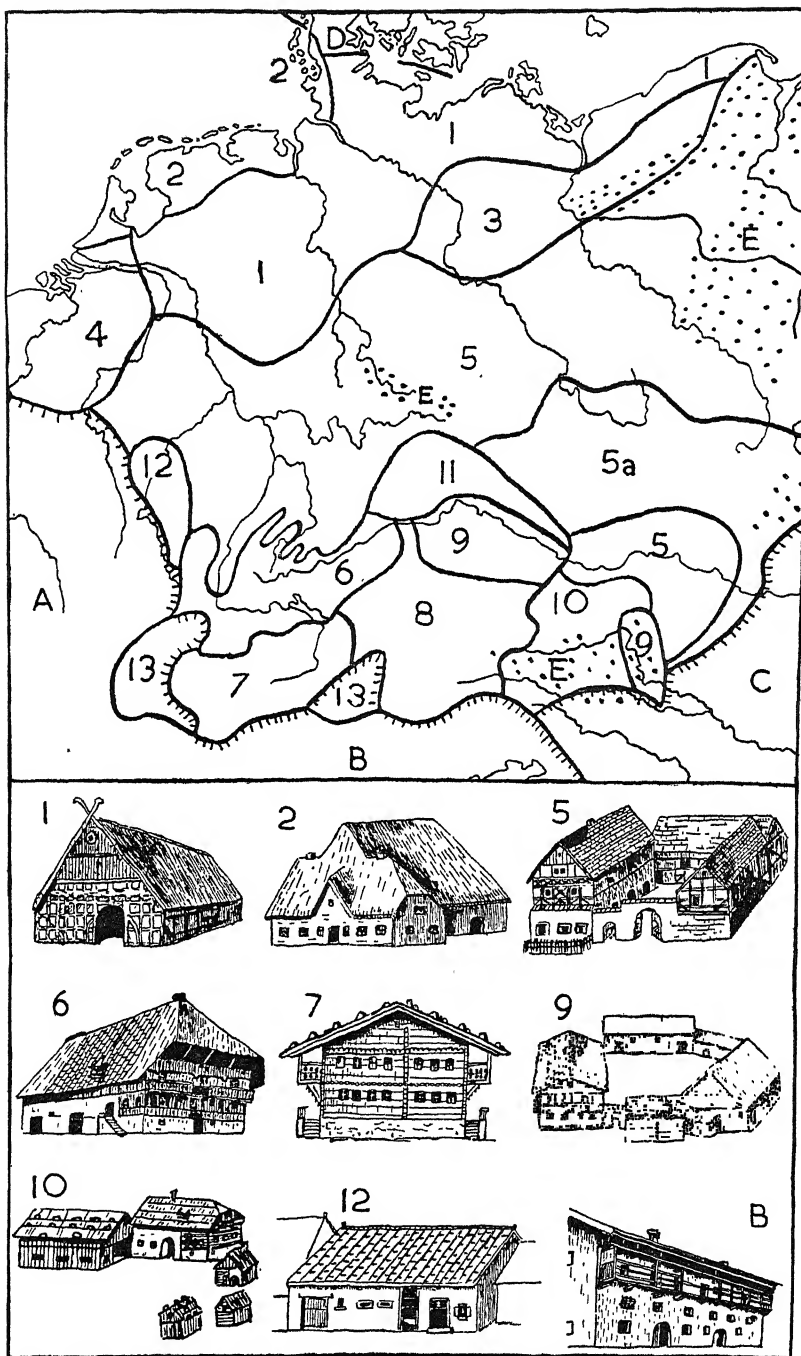


Fig. 26—FARMHOUSE TYPES

The Saxon house is characteristic of the northwestern lowland. In central *Diele* is continued right through the building with stables living-quarters on either side. Outbuildings sometimes appear to local farming; for instance, there are separate barns for cattle and so on in the northern marshes and in the Lüneburg Heath. The farmstead has a rafter and beam frame, originally a straw roof, and a timber framework that was later modified with the addition of brickwork. Brickwork may be noted, is especially characteristic of the Frisian farmstead. In Westphalia a variant appears sharply to the south coinciding with the boundary of the Low German dialect. It has its cattle stalls at the same height as the centre and the roof is carried by the *outer* uprights. A similar type is the small house in the towns of Lower Saxony and Westphalia, in which a large gate in the gable frontage leads to the central space (*Diele*); this arrangement is evidently indicative of its rural origin (Pl. 4).

The Middle German farmstead consists of two or more separate buildings grouped at right angles to each other around a central rectangular farmyard. It is half-timbered with lath and plaster (*Fachwerk*). The steep roof is supported by uprights (*Pfetten*) against the main ridge-pole in the gable and side pieces parallel to it. These uprights thus divide the inner space of the building into compartments so that the large central space of the Low Saxon house is absent and the house is entered from the side (not a gable-end) gateway. The house has two storeys, and there is a separate kitchen with fireplace, a living-room with a warming oven, and so on; it is generally half-timbered. Thus, in origin and form, this farmstead is fundamentally contrasted to the Low German type. It occurs throughout central Germany, especially in Franconia, whence its alternative name, and it has spread north into the Harz Foreland, and southeast into the Neckar basin and the Rhineland. It was adopted throughout the greater part of the eastern colonized lands, in the Northern Lowland, the Danube lands and the foothills of the eastern Alps (Pl. 3).

FIG. 26—FARMHOUSE TYPES (from Sydow-Wagner)

The Low German Unit Types. 1. Saxon Farmstead. 2. Frisian Farmstead. 3. Elbian transition type. 4. Flemish farmsteads.

The Middle German Group Type (several buildings on two or more sides of a rectangular yard). 5. The Frankish farmstead. 5a. Frankish farmstead in non-German areas.

The South German Unit Type. 6. Alemannic or Swabian farmstead. 7. Swiss farmstead (*Lünderhaus*). 8. Bavarian farmstead.

9. Austrian Group farmstead. 10. Austrian irregular clustered farmstead. 11. Transitional types. 12. Lorraine stone-built unit farmstead. 13. Rhaeto-Roman stone-built unit farmstead.

A. French farmstead types. B. Italian farmstead types. C. Slav-Magyar irregular clustered farmsteads. D. Danish (Scandinavian) farmstead types. E. East European single-room house (*Vorlaubenhaus*, *Rauchstube*).

Below the map are diagrams of certain of the major types (from Sydow-Wagner *Medieval Germanischer Schul-Atlas*).

The Upper or South German types are unit farmsteads, and have developed from the basic Middle German type. They are usually divided into two groups known as the Swabian and Bavarian types. The Black Forest house, which is very characteristic of the Swabian area, has two storeys, a vast overhanging roof, covered with shingle or straw, hipped at either end, and is built partly of timber. On the ground floor are the stalls, and above are the living-quarters (with separate living-room, and a kitchen with fireplace and oven), surrounded by a balcony, and above again are the hay-lofts, which are approached by a gangway, built from the steep slope on which the house is usually built. This type occurs in northern Switzerland (*Dreisässenhaus*).

The Frisian farmstead is confined to the Frisian lands on the North Sea coastlands from southern Holland to western Schleswig-Holstein, and is especially typical of the raised mound sites (*terpen*) in the marshlands. The Saxon house is found throughout the Northern Lowlands. It extends to the Ruhr, Wupper and Eder rivers as far as the Rothargebirge; to the Harz mountains in the south; west to a line from Utrecht to Aachen in the west; and beyond the lower Elbe along the Baltic coastlands to Pomerania in the east. The Middle German or Frankish farmstead occurs throughout central Germany, especially in the lands settled by the Franks (Franconia), whence its alternative name. It has spread by contact and colonization north into the Harz Foreland, and south into the Neckar basin and the Rhine plain. With modifications it has been introduced into the colonized lands in the Northern Lowlands, the Danube lands and the eastern Alps, as far as the Bakony Wald, and it has been gradually adopted in the Czech lands of Bohemia. The Upper or South German unit farmsteads have developed from the Frankish type, as adaptations to a pastoral economy in wooded upland environments. Its main types are the Swabian or Alemannic, the Bavarian, and the Austrian types. The Black Forest house is the best-known example, and it is repeated in the farmstead of northern Switzerland (*Dreisässenhaus*). These South German farmsteads do not appear in the great area of colonization in the Northern Lowlands, since the peoples of the south-west took little part in it; moreover, these types are peculiarly adapted to a mountain pastoral economy.

These German house types, when viewed as a whole, merge east, west and south into other culture areas in which the house forms show distinct features, though everywhere the change is through areas of great intermixture. To the south the limits are most marked. Here the Italian styles consist of stone building material, the houses are storied, with an outside balcony, rather flat roofs, few and small windows, and the houses occur in compact village groups. Such types are found in southern Switzerland (Freiburg, Valais, Tessin, Engadine), the Jura, the Italian

Tyrol (midway between Trient and Bozen), and south of the Karnic Alps.

APPENDIX. TYPES OF RURAL SETTLEMENT

The following list refers to sheets of the 1:25,000 and 1:100,000 scales that illustrate the different kinds of settlement.

1:25,000:

Examples of dispersed settlements:

Streusiedlung.

Einzelhof (dispersed habitat), Bl. *Buldern*.

Weilersiedlung (hamlets), Meinerzhagen.

Gutsiedlung (estate farm), Thelkow.

Examples of nucleated settlements:

Haufendorf, Bl. Hohen Hamen.

Rundling, Luchow.

Strassendorf, Messdorf.

Angerdorf, Gross Rade.

Reihendorf, Ziegenhals.

Waldhufendorf, Königshain.

Marschhufendorf, Norden.

Moorkolonie, Papenburg.

Friderizianische Siedlung, Dechsel.

1:100,000:

Streusiedlung: 308, Bielefeld, 330 Münster-i-Westfalen, 378, Crefeld, 379 Elberfeld.

Haufendörfer: 311 Hildesheim, 356 Soest (also dispersed), 438 Erfurt.

Strassendörfer: 213 Perleberg; 248 Friedeberg, 271 Cüstrin; 367 Finsterwalde, 450 Ohlau.

Rundlinge: 187 Parchim, 213 Perleberg.

Waldhufendörfer: 371 Sprottau, 420 Görlitz, 442 Dippoldiswalde, 448 Waldenburg, 469 Annaberg.

Weiler: 534 Kernnath, 550 Sulzbach, 581 Cham.

Marschhufendörfer: 145 Stade, 175 Brake, 203 Bunde.

Wurten: 172 Emden.

Moorkolonie: 255 Laar, 204 Leer, 176 Bremervörde.

Kolonistendörfer: 75 Friedland, 104 Rossel.

CHAPTER 7

TOWN AND ROUTE

*Der Charakter der Städte wechselt von Landschaft zu Landschaft. Verwandte Geschieke, verwandte Bilder.*¹—Friedrich Ratzel, 1898.

URBAN BEGINNINGS IN THE WEST GERMAN LANDS

THE MEDIEVAL town in the west German lands gradually crystallized as a distinct settlement in the early Middle Ages. In the Early German period, the functional elements which later were combined in the town were scattered over the land, and were not associated with compact or even permanent settlement. In the Carolingian period, in the Romanized Rhinelands and the upper Danube lands, and, in the tenth and eleventh centuries, beyond in Inner Germany, there appears a settlement which is distinct from the village, in its function, topography and legal constitution. This is the embryonic urban habitat, which consisted of two distinct topographic parts, the stronghold or burgh (*urbs*) and the settlement outside its defences (*suburbium*).

The stronghold was the first nucleus of settlement. It enclosed a bishop's seat, an imperial palace or a seat of seigneurial administration. The foundation of these strongholds is to be attributed to three main developments during the Merovingian and Carolingian periods. Secular administration was placed in the hands of counts, representatives of the emperors, who governed definite areas from fixed stronghold centres. The spread of Christianity was also effected and organized from bishops' sees over diocesan areas. Lastly, the invasions of the tenth and eleventh centuries led to the construction of fortifications throughout western and central Europe, both to defend these existing settlements, and to serve as new places of refuge for the folk of the countryside. These new strongholds or burghs contained permanent garrisons recruited from the knights of the *gau*, for which each was the centre. These secular and ecclesiastical areas were both adjusted to the early German *gaue*, and their centres invariably placed in or near existing strongholds of Early German and Frankish origin, which were selected from a large number of such strongholds on account of their outstanding nodality.

In the eighth century and after, the demand for luxury goods increased, and itinerant merchants, notably the Frisians in northwest Germany, began to segregate in small communities in the vicinity of these new seats

¹ The character of towns varies from one region to another. Similar functions beget similar forms.

of secular and ecclesiastical administration, where they found a permanent group of consumers, protection afforded by the stronghold, and special privileges of communal life. Foremost among these are the fifteen oldest settlements in the area of the Holy Roman Empire, the Roman settlements of Cologne, Regensburg, Mainz, Worms, Constance, Zürich, Trier, Augsburg and Basel; and the Carolingian seats of Magdeburg, Dortmund, Cambrai, Goslar, Würzburg and Bamberg. Here mercantile communities (*urbes mercatorum*) were early established, and gradually acquired a special law (*jus mercatorum*). This law served as a model for the mercantile settlements which are recorded during the period 900 to 1100, fifty of which were newly founded settlements, and seventy the confirmation of existing Carolingian markets. Most of these recorded settlements (with records of tolls, markets and coinage) are situated in northern Germany.

With their roots in the mercantile settlement (*in suburbio*) there developed the first market settlements. A clear distinction must be made between the market as an institution and as a settlement. The first involved merely the business of exchange at a fixed place; the second involved both an institution and a permanent settlement. Provision markets (*macelli publici*) were held in places of fixed settlement and temporary assembly in the Roman, Early German and Frankish periods. As statutory markets, they increased in number after 900, and were held within the strongholds, catering both to the local groups of consumers and to travelling merchants on the great trade routes. Such markets of themselves did not give rise to permanent settlement, but were incident upon it. The market settlement does not appear as a clearly defined functional, topographical and constitutional entity until the early twelfth century. It is called a *forum* and its settlers *mercatores*. It was the result of a long process of development marked by the growth of local trade, which needed weekly markets for regular exchange, the development of handicrafts, and the migration of free craftsmen from the countryside into the mercantile settlements, where they enjoyed the same privileges as the merchants and often displaced them in both number and authority. A market now signifies a *settlement*, which embraces both the market place, the appurtenances related to it and the house lots for its inhabitants. "Market place and house lots formed an inseparable entity on the land of the lord" (Hamm). The settlers were given freedom from feudal restrictions and elementary rights of self-government. Such settlements appear in the shadow of the strongholds, and were usually grafted on to the latter as separate foundations; but they were also established as separate legal and topographic entities on virgin land, independent of an existing stronghold.

The first towns (*civitates*) developed gradually from those early settle-

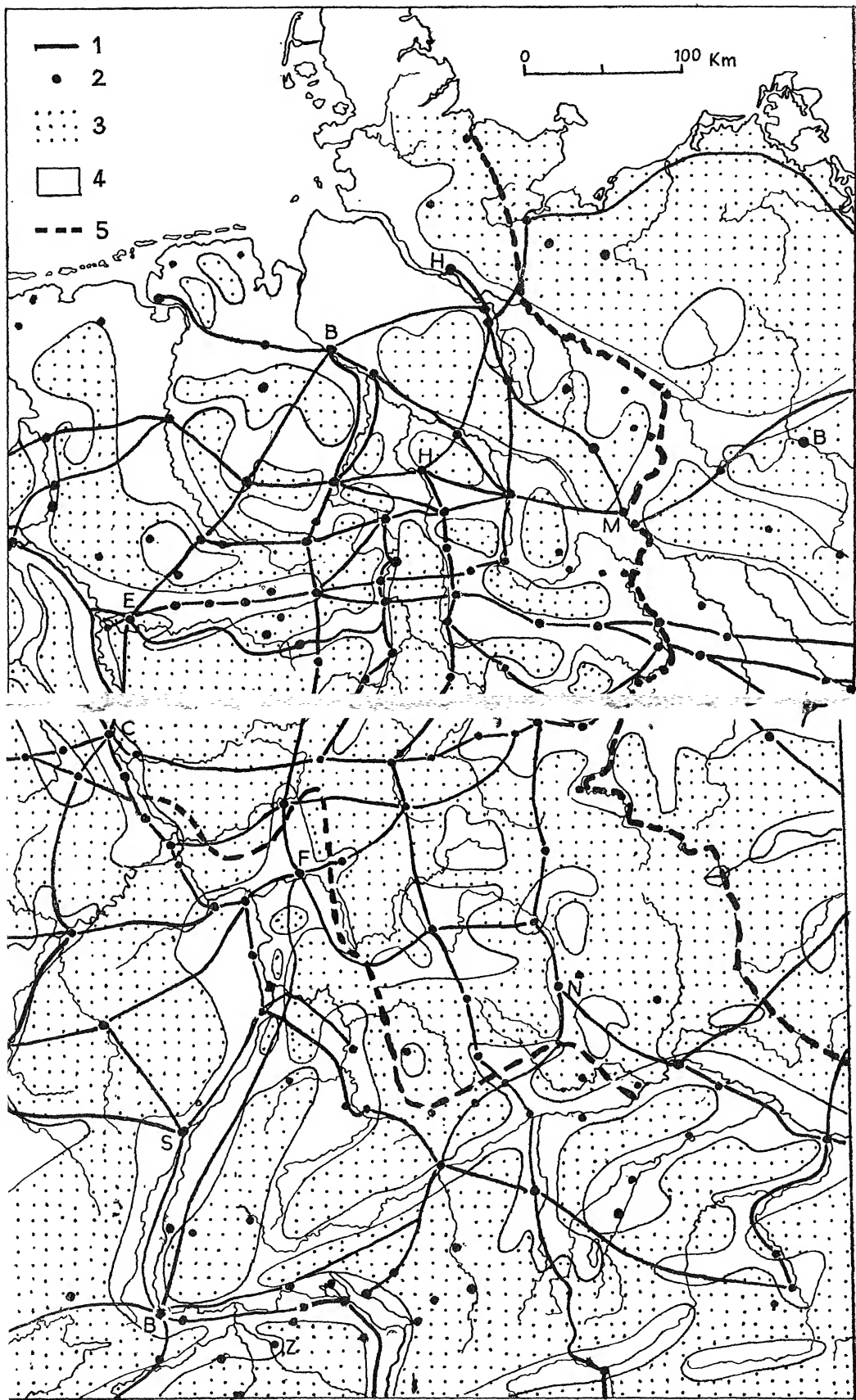


FIG. 27—GERMANY: EARLY MEDIEVAL ROUTES AND TOWNS BEFORE 1200 A.D. (by the author) (scale, 1 : 4 m.)

ments which had their constitutional and topographic roots in the mercantile centre *in suburbio* and their nucleus of crystallization in the stronghold. The new burgher or town communities wrested their rights from the rulers of the strongholds, the first grants of communal rights in the German lands being recorded at Cologne in 1106 and at Goslar in 1107. By the middle of the twelfth century the concept of the town (*civitas*) was fully developed, and the great era of town foundations had begun. A number appear in the latter half of the twelfth century, but the overwhelming majority of the urban settlements throughout the German lands appear during the thirteenth and fourteenth centuries.

The title of *civitas* is usually accepted as the most reliable general and all-embracing expression to designate the characteristics of the medieval town. These characteristics, which distinguished it from the contemporary village, were that it was a seat of handicrafts and trade; it was a walled fortress; and it was a jurisdictional and self-governing entity. These attributes were gained either separately, over a long period of complicated development, or together, with the grant of town law, in the case of founded settlements; while the growth of industry and trade was dependent upon the enterprise of the community in exploiting the possibilities opened up to it. Thus, full town status was not everywhere attained. "There were settlements with a thoroughly urban economy, without defences, and without corresponding legal status, and there were town strongholds without town economy. The aspect of the town also varied in different periods and regions" (Amman). Urban settlements thus show great variety from region to region in the later Middle Ages, with respect to structure, aspect, origin, growth and distribution.

In 1200 there were over 200 towns (*civitates*) in west German lands (Fig. 27). About 120 had embryonic urban character in 1100, consisting of stronghold and extramural settlement. During the twelfth century all these became *civitates*—i.e. fully-fledged towns—and there also appeared an additional seventy, most of which were new foundations. Of the urban settlements in existence in 1100, the majority had their nuclei in the fortified cathedral immunities (*Domfreiheiten*) of the bishops. All these towns were placed on main routes, conveniently accessible to the populous districts of settlements—Roman *castra* in the Rhineland (e.g. Strasbourg and Basel), Frankish *curtes* (e.g. Münster) or Saxon *oppida* (e.g. Fritzlar and Würzburg), or the new communal burghs on the eastern frontiers (e.g. Meissen). The feudal castle did not appear in Germany until the middle of the thirteenth century, in strong contrast to France, where in the ninth and tenth centuries the countryside bristled with the individual strongholds of a swarm of petty sovereigns. For, after the death of Charlemagne, local feudal lords all over France asserted their power, whereas in Germany the great dukedoms were established and

the emperors were able to control the local powers of the counts, who commanded the garrisons of communal strongholds, but were forbidden to construct walls or castles on their own account. Thus the earliest castles in Germany were imperial residences, about ten being located in the Rhineland in the Carolingian period, and only two of these ten gave rise to towns—namely, Frankfurt and Aachen. A second group of castles was built by the Saxon emperors in the Harz region in the eleventh century (e.g. Goslar), and a third by the Hohenstaufen in Swabia in the twelfth century (e.g. Ulm). Down to 1200 only about twenty towns with such castle origins had come into existence.

During the twelfth century, towns evolved slowly through the further growth of the mercantile community, local handicrafts, and markets, near strongholds. But most outstanding in the latter half of the century is the foundation of entirely new market settlements (*fora*) by the great dynastic families, in order to foster trade. Such settlements, built on virgin land, were not parasitic on existing strongholds, and soon received the full status of a town (*civitas*). They were completely self-governing and were responsible for their own defence. The most outstanding examples are Freiburg-in-Breisgau and Lübeck.

Both the stronghold and the mercantile settlement were of necessity placed on the main routeways, especially at break of bulk points, and in places centrally situated with respect to the then peopled areas, for the functions of the merchant and the market no less than those of the Church and the lord depended upon contact both with the surrounding areas and, by main routes, with the outside world. All these factors contributed to the origin and development of the early medieval town, although it is impossible exactly to evaluate any one of them. The towns, in 1200, then, are closely related to the areas of initial German settlement on the forest-free lands, and to the great corridors of movement that traverse these zones, linking the towns with each other and with the Rhineland. A main belt of towns is located in the Romanized Rhineland and the areas flanking it in the middle Main and Neckar basins. Running from east to west through Inner Germany there are two other main zones of early settlement and eastward penetration, in which urban life had early beginnings.

The first is the great belt of forest-free land on the northern border of the Central Uplands from the Cologne Bay to Thuringia. The close route net of this belt in the late Middle Ages had its initial axis in the great Hellweg highway, built by Charlemagne, from Duisburg to Paderborn. From Paderborn, routes ran to the Weser crossings at Höxter, Hameln, Herstelle and Minden. Thence main routes ran along the Harz Foreland to the Elbe at Magdeburg, and south of the Harz via the Goldene Aue to Erfurt and Halle in Thuringia. A further route ran

from Duisburg via the Porta Westfalica to Bardowick, the precursor of Lübeck. It linked the Rhineland with the Baltic and Slav lands and interconnected the bishops' sees of the Northern Lowlands.

The second zone is marked by a group of towns in the Bavarian Plateau, together with a series along the Danube. The first group was associated with the transport of salt from the Salzach valley, and with the trans-Alpine route via the Brenner; the second with the progressive expansion of the settlement frontier down the Danube, ending with the foundation of the *civitas* of Vienna in 1107. The location of these places at break of bulk points and bridge crossings facilitated their growth during the twelfth century. Finally, frontier towns, beginning both as bishops' seats and as trading centres, were established in a series on the line of the Elbe and the Saale. All of these early medieval routes ran from east to west, and, with their western termini in the two great early medieval emporia of Mainz and Cologne, they had their eastern termini in the outposts of Christianity and trade at Bardowick, Magdeburg, Erfurt and Halle.

Between these two main zones of settlement in the north and south lay the Central Uplands and the eastern part of the Main-Neckar basin, which were as yet virtually untouched by urban development. The eastward spread of settlement in the Main-Neckar basin beyond the *limes* into the zone of forest and marsh in the Keuper marl lands was tardy, except in the loess lands of the middle Main, where Würzburg was the capital. Bamberg, an ecclesiastical focus, and Nürnberg, an imperial castle seat, achieved town status in the twelfth century, but the north-south route which linked them was not important until the later Middle Ages (after 1200), the chief early medieval route running via Ulm on the Danube down the Neckar valley, via Geislingen, to Mainz. Conspicuous is the relatively large number of towns, a total of over a hundred, in northern Germany, as compared with about seventy in the south German lands, while there is a marked paucity of towns in the Northern Lowlands, in the central forested uplands, and in Franconia east of the *limes*.

THE WEST GERMAN LANDS IN THE LATE MIDDLE AGES

At the end of the Middle Ages the total number of towns in the west German lands reached almost two thousand, while to this total a large number of market settlements must be added. By the end of the fourteenth century the network of urban settlements was virtually complete. The highest densities, reaching one town to some 100 sq. km. or less, are to be found in the Saxon Börde, the upper Rhine plain, northern Switzerland and the Neckar basin. In these areas the majority reached town

status before the end of the thirteenth century. In the Northern Lowlands and the Bavarian Plateau the market settlement outnumbers the town; there is one urban settlement (i.e. including towns and market centres) to 100 sq. km., but only one town to every 300-400 sq. km. The towns in all the wooded upland areas, as well as in the Hessian and Thuringian Corridors and in Franconia east of the *limes*, appear mainly in the fourteenth and fifteenth centuries, and followed in the wake of forest clearance, rural settlement, mining, and the construction of castles. They are usually spaced at regular intervals on the main routes, with a density of one town to about 150-250 sq. km.

We must emphasize strongly that town status could be attained only through the sanction of high authority. Towns were sited, built and given corporate character through the initiative of the territorial lord, lay or ecclesiastic. The great majority were laid out as new market settlements or as planned extensions of existing settlements; or an existing settlement, village, or market was raised to town status. A new foundation was a speculation, the motives of the founder being economic—i.e. financial gain—or political—i.e. to defend, organize and administer his territories. The lord could grant the facilities for a community to engage in crafts and trade; but he could not create these activities, which are the essence of urban life. The capacity of such a settlement to exploit the possibilities accorded to it by the lord depended on its ability to function as a seat of industry and trade. Such possibilities were afforded by overland traffic, local market trade, defence and administration.

Merchant traffic in the Middle Ages, even as early as the Carolingian period, was confined to the public highway (*via regia* or *publica*), in the interests of the regulation of traffic and the protection of the merchant by the emperors. Thus, in considering the potency of wholesale traffic in urban development, these routes alone come into question. The early medieval routes have already been noted. The route net in the later Middle Ages reveals certain features which are relevant to our theme. The east-west traffic, which dominated trade down to about 1200, was later supplemented by a development of north-south traffic, due to the development of trans-alpine trade in the south, and North Sea and Baltic trade, largely controlled by the Hanseatic League, in the north. Consequently there emerged many new routes across the Central Uplands. These formed a skein of routes across the wide Hessian Corridor, a concentration of river and land routes in the Rhine gorge, and a second skein between the Harz and the Thuringian Uplands. Thus, the Saxon Foreland became a great nexus of east-west and north-south routes. (Fig. 27.) In Westphalia, however, the narrow zone of open rolling country which lies between the Münster lowland to the north and Rhine Massif to the south was traversed by the Hellweg. This route linked up a series

of springline points on the northern edge of the chalk outcrop, where both fresh and saline water early attracted permanent settlements, which soon reached town status (Dortmund, Soest and Paderborn). This zone, however, lacks north-south routes, and its chief towns, Dortmund and Soest, lost their early pre-eminence because of their lack of nodality, and were superseded by the towns of Lower Saxony, where, in the Saxon Foreland, the east-west land routes were crossed by north-south river and land routes, which ran north to the Baltic ports. Located at river crossings in this foreland zone, towns had early origins and grew to great prosperity in the later Middle Ages.

The grant of a weekly market usually figures as one of the first privileges of such settlements, which were often established in the first place to function as market centres. In the Northern Lowlands, in particular, towns were raised from market settlements which, in their turn, had gradually grown from village origins through the grant of market rights. These places grew gradually, as early as the ninth century, as centres for the marketing of cattle and cloth from the surrounding countryside. In south Germany many towns "were situated on unimportant side routes and cannot therefore be explained in terms of long-distance wholesale traffic. We can explain their real economic basis, even for the early medieval period, only in terms of their trade with the surrounding market area" (Gradmann). Local market trade was a main factor, together with that of the thoroughfare resting-place, in the function, spacing and survival of the urban centres. But it should not be exaggerated, for there are in fact numerous towns which began as mining settlements, seats of castles, or agricultural villages, in which the weekly market for the trade of the surrounding district made a belated appearance. Moreover, even with an arbitrary market radius of five kilometres, the market areas in regions of high town density overlap greatly, as in Alsace, the Neckar lowlands, and northern Switzerland. Clearly, a variety of conditions affected both the origin and survival of the medieval town.

The chief of these governing considerations in the foundation of towns in the later Middle Ages were the functions of defence and administration. In the early thirteenth century, when the western countries were approaching political unity, Germany was plunged into feudal anarchy, from which she did not recover for two hundred years. Feudal wars and excessive territorial disintegration led to the construction of castles and towns in large numbers to serve as border fortresses on territorial frontiers, or as the administrative centres of small geographical districts within which the chaotic complexity of feudal relations was supplanted by the consolidation of legal powers (*dominium terrae*) under the control of representatives (*advocati*) of the lord. In this way many towns were founded adjacent to castles or villages, and markets were raised to town

status, to serve as centres of administration and defence. The political framework did not crystallize until the fifteenth century, and then many towns which were endowed with a planned layout, a market place, a wall and the machinery of self-government embodied in the *Rat*, could not function as effective centres of trade, besides losing their strategic *raison d'être*. These are what Gradmann has called *Verunglückte Spekulationen*, and they include many "dwarf towns" which are so typical of Württemberg.

The small territorial lords also sought to swell their revenues by granting town status to wealthy communities, especially villages of vintners, or by founding fortress towns and castles on the great trade routes in order to draw tolls from their through traffic. It is for these reasons that such a high density of towns occurs in the rich vine lands of Alsace and the Neckar basin in Swabia, where territorial disintegration after the end of the Hohenstaufen line was rife; and in the Rhine gorge and the Hessian Corridor, where the lords fought to obtain control of existing towns and establish new ones along the great overland trade routes. In the Rhine gorge the territorial lords saw in a walled town on the river front a source of potential revenue, not only from the wealth of the vintners, but also from the tolls which could be drawn from this great highway of commerce. The lure of the Rhine is evidenced by the many towns on both sides of the river, which lay in the Middle Ages within the territories of one or other of these lords, and the many toll stations designed to intercept traffic. There were in 1400 no fewer than twenty-six toll stations between Mainz and Nijmegen. To these an equal number was added after 1400.

In all these areas of territorial disintegration, the early urban settlement was primarily a fortress town, and there are virtually no unwallled market settlements. On the other hand, in the large territories, which were under one central control, there was no cut-throat competition between rival petty lords and so not the same need for strongholds. Market settlements were granted large measures of self-government, and there was no necessity to expend many years and much wealth on the construction of walls and castles. Thus, while territorial disintegration is the keynote to the foundation and close net of towns in southwest Germany, in Bavaria and the Tyrol, on the other hand, thanks to a unified political control throughout the Middle Ages, towns and castles are fewer, and the urban settlements, though placed at frequent intervals, as in the former areas, are small in size (usually under 2,000 inhabitants), and are mainly unwallled market settlements. The unwallled market is characteristic also of the Northern Lowlands, which also escaped territorial disintegration, although in both areas the small density of rural settlement and low productivity of the soil were undoubtedly contributory

factors to this mode of urban development. The main difference between these two areas is that in the north both markets and towns grew from village origins, while those of the Bavarian Plateau and the Tyrol were deliberately founded and planned settlements.

THE EASTERN LANDS OF GERMAN COLONIZATION

In the eleventh century, the Marchlands lay beyond the limits of the German dukedoms. They formed a belt which stretched from the North Sea to the Adriatic with the wedge of Bohemia in the centre. To the north lay the Billingsmark, the Nordmark, Ostmark and Thüringermark between the Elbe-Saale and the Oder-Bober rivers. To the south, including the eastern Alps and their foreland zone, lay the Ostmark, astride the route to the upper Danube land; as well as the Marchlands of Carinthia, south to the Karawanken mountains, and Carniola, between the latter and the peninsula of Istria.

In the southeast of the Reich, after the defeat of the Magyars on the Lech in 955, the Bavarians extended rapidly from their hearthland in the Bavarian Plateau, into the eastern Alps and the Danube lowlands, to the limits of the Reich. In contrast to what had happened in the northern lands, German political control and close rural settlement had already reached this limit before the trans-Elbian movement had effectively begun. Effective German conquest of the Slav tribes, and eastward migration and settlement beyond the Elbe-Saale frontier, date from the latter half of the twelfth century. This process began with the acquisition of the Altmark by Albrecht the Bear in 1134 and the foundation of Lübeck by Henry the Lion in 1158. Then there set in the great eastward movement of conquest, colonization and Christianization, under the ægis of bishop, monk, noble and trader, which continued for two hundred years. This brought into the pale of German settlement and culture an area equivalent to that of the motherland, embracing Mecklenburg, Pomerania, the lower Vistula lands and East Prussia, Saxony, Silesia, and the upland borders of Bohemia. Beyond, settlement spread into areas of alien speech and culture. The Teutonic Knights and the Hanseatic League spread German influence by crusading zeal and trade into the coastlands and the remoter interior of the Baltic provinces, from the Vistula to the Gulf of Finland. Peaceful penetration by traders, usually at the invitation of Slav rulers, resulted in a sporadic distribution of rural settlements and towns of German origin in Poland, along the Carpathian Foreland, and southwards into Bohemia and Moravia.

The beginnings of town life in these lands antedate the German colonization. From Esthonia to Burgenland communal strongholds were constructed in the early Middle Ages, as in western Europe. These

served as seats of secular and ecclesiastical administration and as places of communal refuge, containing garrisons drawn from their surrounding districts (Latin, *comites*; German, *Burgbezirke*). Many of them were on the sites of preceding Slav strongholds (*Rundwälle*). Near the stronghold there clustered, *in suburbio*, a servile peasantry and some itinerant merchants who enjoyed special privileges (*hospites*), and both were dependent on the stronghold. Here there were held periodical assemblies—usually once a year—which were called markets (*fora*, or *loca forensis*)—i.e. the market was periodic and did not imply a permanent settlement. These places were nearly always situated on the main routes at break of bulk points, notably at the crossings of rivers by main overland routes. Such river crossings first became resting-places for through merchant traffic, and, since the merchant was obliged to rest there, they gradually became seats of periodical assemblies for the sale of the merchants' goods and local produce. Many periodical markets were held on the sites of Slav strongholds and at places of pagan worship, which were subsequently selected as seats of Christian monasteries and churches, and as seats of the administrative strongholds (*Burgen*) which were erected in the eleventh and twelfth centuries. Thus, with origins reaching back into early pagan times, when places were used for periodical assembly and not necessarily for permanent settlement, the native settlement immediately preceding the advent of the German town consisted of a stronghold and *suburbium*. In origin and form, this was akin to the early settlements which preceded the spread of the town in the west German lands. Such urban origins and similar pre-German settlement-forms are to be found in Poland, Silesia, Bohemia, the middle Elbe basin, Brandenburg, the eastern Alps and the Burgenland in eastern Austria.

The German town, as a legal and topographic entity, with a planned form, such as it had developed further west, appears in these eastern lands in the thirteenth century. (Fig. 29C.) German law was granted to most of the Slav urban nuclei, often accompanied by the layout of a new adjacent settlement. But these nuclei occur in only a small proportion of all the towns which existed at the end of the Middle Ages, for the overwhelming majority were entirely new creations. Over fifteen hundred towns were established between 1200 and 1400. The process of colonization was undertaken by authorities who controlled large areas and delegated the business of laying out villages and towns, and recruiting their settlers, to experienced "planners" (Latin, *lokatores*). There was absent that feudal strife which largely conditioned the origin and development of towns further west. Consequently, the towns are more evenly distributed and wider apart (a day's journey of some six to eight hours as compared with four or five in western Germany). Moreover, there are very few unwallled market settlements. Although the town was usually

a new creation, its location was not independent of the preceding development in the lands to which it was introduced. Towns were placed near to the sites of Slav strongholds and periodical fairs. The chief lay, like the latter, at nodal points on overland routes, but the majority were small local market centres, which were often founded together with a group of villages in their vicinity.

The law of the German mother towns was granted to these colonial towns (*Kolonialstädte*) and spread in three well-defined directions, a fact which is to be associated with the place of origin of the immigrants and the direction of commercial contacts. First, the towns of the northern coastlands, from Holstein to Pomerania, and beyond in the Baltic lands, adopted Lübeck law, a distribution which is to be associated with that of the trade connections of the Hanseatic merchants, many of whom were of Lübeck origin. Second, in Bohemia-Moravia, Austria and Bavaria, the law of Nuremberg was adopted in the west, the law of Vienna in the south, and the law of Iglau and Brünn in the east. The mining settlements of the Zips region and southern Moravia developed an independent law. Third, Magdeburg law spread east of the Elbe to include northeastern Bohemia, and the northern lowlands as far as a line from Königsberg to the Carpathians. The wide distribution of Magdeburg law was facilitated by the fact that the great stream of emigration came from central Germany, and by the existence of a single great political entity, Poland, which gave to all its towns Magdeburg law or its derivatives.

The German eastward movement waned in the fourteenth and fifteenth centuries, although it was followed by a second wave of emigration in the seventeenth and eighteenth centuries, in Poland, the Danube lands and south Russia. The reasons for this decline of emigration, as too of German cultural influence, in the later Middle Ages, is to be associated with the devastation caused by the Black Death in the middle of the fourteenth century, which decimated the supply of potential emigrants. Further, German influence in eastern Europe was offset by the great national awakenings—the heyday of Polish and Lithuanian power, the Hussite movement in Bohemia, and the revival of Hungary. As regards the Baltic region, the Teutonic Knights were defeated by the Polish-Lithuanian power in 1410. After 1370 (the date of the treaty of Stralsund, signed after the defeat of Denmark) the Hanseatic League controlled the Baltic Sea and a far-flung series of trading stations reaching as far as southern Scandinavia (e.g. Stockholm and Oslo) and Russia. But its power waned towards the end of the fifteenth century, owing to complicated circumstances, which must be studied elsewhere.

Thus, the spread of the German town as a distinct settlement and legal entity had virtually run its course by the end of the Middle Ages. The

far-flung extent of German culture contacts in central Europe and west Russia diminished in the following centuries. Many new towns were founded independently in these countries. But German town law and many German communities remained from the Gulf of Finland to the Danube, while, particularly in the latter area, German colonization was renewed with the settlement of the steppes in the eighteenth century.

THE RENAISSANCE AND BAROQUE TOWN (c. 1500-1800)

It has been calculated that at the end of the Middle Ages the population of the Holy Roman Empire was about 12 millions, of whom some 10-15 per cent lived in towns. There were not far short of 3,000 towns in the Reich, and 12-15 of these had over 10,000 inhabitants. Six, according to Sanders,¹ exceeded 20,000, and only Cologne and Lübeck had more than 30,000 inhabitants. From 15 to 20 had between 2,000 and 10,000 inhabitants, and about 150 from 1,000 to 2,000 inhabitants. The remainder, some 2,800, had between 100 and 1,000 inhabitants, and 2,500 had less than 500 inhabitants.² Thus, again, in the words of Schmoller, "One can perhaps say that the increase from A.D. 500 to 1340 of two- or threefold to 12 millions was a greater achievement than the increase from 15 millions to 64 millions from 1700 to 1900".

Stagnation set in towards the end of the Middle Ages, and especially after the ravages of the Black Death in 1348, from which it took centuries to recover. Added to this there was the incredible number of deaths in Germany resulting from the Thirty Years' War, so that the towns often had fewer inhabitants in the eighteenth century than three hundred years earlier. Almost all German towns increased till the thirteenth-fourteenth century; then came a rapid decrease, often caused by the oppression of a territorial lord, and then in the eighteenth century another period of growth. This is clearly revealed in the population curves of such cities as Cologne, Soest, Worms, Basel and Mainz.³

During the sixteenth, seventeenth and eighteenth centuries, there occurred important changes in the character and distribution of industry which were not without effect on the location and growth of towns. Industry in the Middle Ages was almost exclusively concentrated in the towns and controlled by their guilds. Every town had a variety of handi-

¹ P. Sanders, *Geschichte des deutschen Städtewesens*, Bonner Staatswissenschaftliche Untersuchungen, Heft 6, 1922.

² H. Bechtel, *Wirtschaftsstil des Deutschen Spätmittelalters: Der Ausdruck der Lebensform in Wirtschaft, Gesellschaft und Kunst von 1350 bis zum 1500*. Munich and Leipzig, 1930, p. 31 et seq. At the end of the Middle Ages Cologne had about 30,000-35,000 inhabitants; Strasbourg, Nuremberg and Ulm about 20,000 each; Ausburg and Hamburg about 18,000, Basel 9,000, Leipzig 4,000, and Dresden 3,000. Lübeck reached 22,000 in 1400, while Frankfurt and Zurich had about 10,000 inhabitants. See B. Heil, *Die Deutschen Städte und Bürger im Mittelalter*, *Aus Natur und Geisteswelt*, No. 43, Berlin, 1921.

³ Article by K. Frenzel, in *Die Stadtlandschaften der Erde*, ed. by S. Passarge, 1930.

crafts, which of necessity, owing to the lack of transport facilities, catered primarily for the folk in the surrounding countryside. The large cities alone were seats of specialized industry. Western Europe was traversed in the later Middle Ages by numerous routes which were great arteries of commerce and on which towns were located where materials were collected from, and goods distributed to, distant markets. Already, however, certain minerals and sand (for glass-making) were worked where these materials were obtained, far from the towns, in remote upland districts, which would otherwise have been shunned by settlers who sought to live from the soil. Glass-making, metal-working (gold, silver, copper and tin), and porcelain-making were especially important in the uplands of Germany. All these required charcoal as fuel and running water, in addition to their particular raw materials. This brought about a considerable dispersion of industry. This trend applied also to the textile industries. Everywhere freedom from the restrictions imposed by the guilds was sought. This general development was found in the German states, as well as in Flanders and France. In Prussia, the heyday of mining in the uplands came in the fifteenth and sixteenth centuries, and the Erzgebirge, the high uplands of Saxony, is the only area in western Europe where a considerable number of new towns were founded in this period. But the subsequent decline of metal-working released a large labour supply that could not possibly eke out an existence from the impoverished soil of small-holdings at high altitudes. The kings of Prussia encouraged the development in these areas of the textile industries as a domestic occupation, and this was organized by merchants (*Verleger*) from town centres. Much the same development took place in the states of southern Germany behind the shelter of their tariff walls. Thus, there was a widespread distribution of rural industry in France, the Low Countries and the German lands at the opening of the nineteenth century, and this added to the importance of the town as a commercial centre.

THE GERMAN CONURBATIONS

The phenomenal growth of modern urbanism in Germany, as in the rest of western Europe, resulted in the concentration of population in a relatively few agglomerations, which were normally existing and flourishing historic centres, that were able to grow further by reason of their momentum and the favourable conditions of their location, or, more rarely, entirely new agglomerations that emerged through the exploitation of local raw materials. Mushroom industrial towns of the latter character on the Continent, however, usually had their nuclei in a historic town, as Essen, Duisburg, and Dortmund, in the Ruhr. There

are, however, entirely new urban areas between these nuclei in such coal-mining districts as the northern border of the Ruhr and in Silesia. British nineteenth-century growth, as is well known, often centred on small market-crafts towns, of no historic significance, such as Manchester and Birmingham, and numerous new mining settlements appeared on the coal-fields. This entirely new growth is less common on the Continent, and it is far more usual for the new growth to be concentrated around the largest of the historic cities.

A further point is that the growth did not effectively take hold on the Continent, as we have seen in Ch. 5, until the last decades of the century and, in consequence, presents marked contrasts to British urbanism. The development of industry, commerce, administration, and service demanded growth around the historic centres and the transformation of these centres. Such changes have taken place there mainly since 1850, and in the last fifty years at an accelerated pace. The great majority of small towns with a few thousand inhabitants have changed in their social and economic structure, but in build they retain their historic traits and have changed little in size.

There were fifty-eight agglomerations with over 100,000 people in Germany in 1933, with an aggregate of 24 million inhabitants. If we exclude Berlin with 4,664,000 people, there are six others that clearly emerge as much larger than the next largest; and they have 750,000 to 1,000,000 people. These are Hamburg, Cologne, Dresden, Munich, Leipzig and Frankfurt. None of the Ruhr cities come into this group, though Essen comes next on the list. But if we group the Ruhr towns from Duisburg to Dortmund on the list with their intermediate areas, the Ruhr, which is one continuous urban complex, had at this date a population of 3,250,000. A German worker, K. Olbricht,¹ has calculated the size of these agglomerations and examined their growth. All of the central compact area of the cities increased in aggregate by 5·1 per cent for the period 1910 to 1925. But their outer suburban fringes (outside their administrative boundaries) increased by 10·4 per cent. Indeed if we add an additional million persons who lived in suburban areas, which however lie *inside* the city boundaries (since these have often been greatly extended in Germany in the last fifty years), these two together (termed the outer and inner rings) had nearly 5,000,000 inhabitants and increased by 15·5 per cent. These figures are old, but none the less meaningful.

The German town, with a few exceptions, reached its maximum population in the seventeenth century, before the Thirty Years' War. It was confined within its medieval fortifications, and although during the ensuing centuries many new buildings appeared, the general aspect and

¹ K. Olbricht, "Die Entwicklung der deutschen Grossstädte," *Geographischer Anzeiger*, XXXV, pp. 247-52.

extent of the town remained the same till late in the nineteenth century. Cities which, in the last three centuries, did record an increase in population and in their built-up area, were notably the royal residential cities such as Berlin, Dresden, Munich, Kassel, Hanover, Stuttgart, Karlsruhe, Düsseldorf; the North Sea ports—Hamburg and Bremen; and the growing industrial centres of Elberfeld-Barmen and Krefeld.

Population of 58 German Conurbations (in thousands) in 1933 (from K. Olbricht, "Die Entwicklung der deutschen Grossstädte" in *Geographischer Anzeiger*, XXXV, 1934, pp. 247-52)

Berlin .. 4,664	Gelsenkirchen 385	Lübeck .. 152
Hamburg .. 1,667	Magdeburg .. 371	Erfurt .. 152
Cologne .. 920	Stettin .. 344	*Hindenburg .. 151
Dresden .. 891	Oberhausen .. 325	Solingen .. 140
Munich .. 822	Königsberg .. 316	Zwickau .. 139
Leipzig .. 812	Bochum .. 314	Bonn .. 136
Frankfurt .. 812	Halle .. 241	Münster .. 131
Essen .. 655	Kiel .. 232	*Gleiwitz .. 126
Breslau .. 643	Gladbach .. 204	Darmstadt .. 118
Duisburg .. 581	Kassel .. 202	Plauen .. 114
Düsseldorf .. 573	Aachen .. 194	Waldenburg .. 111
Stuttgart .. 556	Augsburg .. 192	Koblenz .. 110
Dortmund .. 541	Krefeld .. 188	Wurzburg .. 110
Mannheim .. 535	Karlsruhe .. 187	*Beuthen .. 107
Nürnberg .. 520	Hagen .. 177	Heidelberg .. 106
Chemnitz .. 469	Wiesbaden .. 160	Freiburg .. 104
Bremen .. 461	Mainz .. 158	Wesermünde .. 103
Hanover .. 460	Brunswick .. 157	Hamm .. 103
Wuppertal .. 408	Bielfeld .. 153	Osnabrück .. 101
		Remscheid .. 101

*Upper Silesia Coal and Industrial Area: German section (Beuthen, Hindenburg and Gleiwitz) about 400,000; Polish section (Krolewska Huta 80,000, Sosnowiec 109,000 and Katowice 127,000) about 400,000-500,000, giving a grand total for these towns and the intervening small coal-mining communities of about one million.

The Machine Age commenced in the middle of the nineteenth century, but it was not till after 1870 that industrialization and the concentration of workers' homes near mines and factories really began. With the advent of the electrical tramway in 1881 and the development of rapid local transport after 1900, concentration in city centres gave way more and more to decentralization. New settlements have grown on the outskirts of the cities both as industrial settlements, grouped around large new factories, and as residential centres, serving as homes for workers in the city centres. Much of this expansion took place beyond the administrative limits of the city, though the new settlements were functionally a

part of it. This led to the expansion of the administrative areas of the great cities. The urban area is ever expanding around the city towards the limits of its influence which, according to the same German writer, may be taken as forty kilometres—the distance, which can be covered by road or stopping-train in one hour from the city centre. Thus, many parts of the rural-urban fringe lie within, or have been incorporated in, the boundaries of the central city, but often the urban-rural fringe extends well beyond these limits.

FUNCTIONAL TYPES OF TOWN

We have devoted a volume to the question of the functions and geographic distribution of urban settlements, and in that book have drawn heavily on German examples.¹ It is not necessary therefore to discuss this matter at length here, although the general principles should be recalled. The pattern of urban settlements came into being in the Middle Ages and that pattern and the social and economic structure of the individual settlements persisted in the overwhelming majority of cases with little fundamental change until the middle of the nineteenth century. This we have stressed several times. The main changes in the period for 1500 to 1850 were in the growth of a few ports and of the capital cities, capitals, that is, of both the large states, of the small states and, in lesser degree, of the smaller political divisions within the state. This pattern of historic urban centres is shown in Fig. 27 for southern Germany. The places shown are towns defined as on a legal basis, since this is the most satisfactory method of selecting the urban centres that cover these lands. The roads are the medieval highways which largely conditioned the scope for growth, if not the origins, of the towns. The circumstances of their origin and development have already been examined.

The main changes in the growth and functions of these centres came in the period of greatest population increase from 1870 to 1910. It is of significance, of course, that the urban settlements of southern Germany are pre-eminently commercial centres although industry is always present and of varying importance. There are relatively few places that have grown up in the modern period as entirely new industrial settlements. If we look at Germany as a whole it will be found that the settlements of this kind, or those that have become dominantly industrial in the modern period, are mainly situated in northern Germany, in the country that stretches from the lower Rhinelands to the middle Elbe basin.

Various attempts have been made to classify urban settlements on the basis of their functions and we have given particular attention elsewhere

¹ *City, Region and Regionalism*, 1947.

to the role of the local and regional service as a factor of urban growth, as well as that of specialized or primary functions, whether industrial, administrative, commercial or recreational. The centralized services have been examined with particular reference to German towns by several investigators over the last fifty years. Christaller's hierarchy of urban centres, based on the importance of their centralized services, includes the market town, the *Amtsort*, the *Kreisstadt*, the *Bezirksstadt*, the *Gaustadt*, the *Provinzstadt*, the *Landstadt*, and the *Reichstadt*. Christaller shows the classification and distribution of the modern urban centres in south Germany and their theoretical spheres of influence.¹ Compare this map with that of the historic towns and routeways of the same area in Fig. 28. It will at once be apparent that the historic factor, and particularly the conditions of medieval origin and development, are of fundamental importance in explaining many features of the present pattern, since very few new centres have appeared in the modern period, although many of them have changed in status.

An economic statistician, O. Schlier, has attempted a similar classification of urban centres for Germany as a whole in terms of the importance of their local and regional services. His conclusions may be briefly summarized with advantage as a supplement to the more theoretical approach of Walter Christaller.²

The smallest type of central place (*Zentralort*) appears in the country market town (*Marktflecken*). This has a weekly market, is visited by the people from the surrounding villages, hamlets and farms, has a chemist and a large shop, perhaps also a weekly paper, which is read in the district; and the daily life of a number of places around depends on it for their daily needs. A centre of higher order, in whose sphere of influence fall several market towns, is the smaller *Landstadt*, in which there is normally included a *Mittelschule* and an *Amtsgericht*. Above the *Landstadt* is the *Kreisstadt*, which appears in various grades, according to the presence (in addition to the *Landratsamt* and *Amtsgericht*) of other services of both a public and a private character, whose functions affect both the town and the area around it. To the *Kreisstädte* are to be added the larger towns of various grades, up to the large trade centres and the Reich capitals. The essential trait of a central place is then, in this general sense, dependent on the presence of institutions whose competence extends beyond the confines of the town itself outwards to affect the daily life of the environs. To these institutions in the political sphere are to be added administrative functions (with clearly defined areas of competence), and, in the economic field, for example, wholesale trade, and in the

¹ Christaller's map is reproduced in *City, Region, and Regionalism*, on p. 56.

² Otto Schlier, "Die Zentralen Orte des Deutschen Reichs, ein statistischer Beitrag zum Städteproblem," *Zeitschrift der Gesellschaft für Erkunde zu Berlin*, 1937, p. 161.

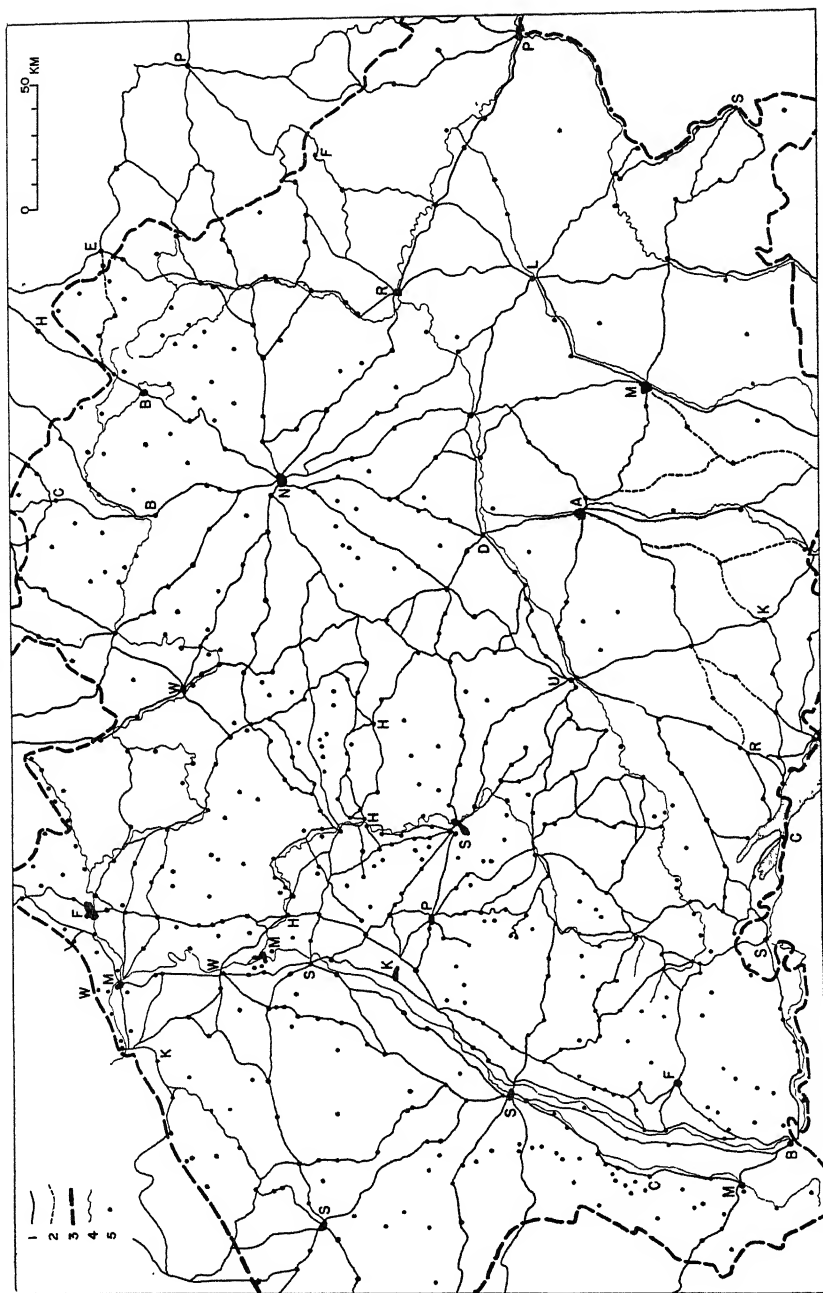


FIG. 28—MEDIEVAL ROUTES AND TOWNS IN SOUTHERN GERMANY (*from Gradmann*) (scale, 1 : 3 m.)

cultural field, central and high school and universities, theatres, newspapers and similar institutions, that serve the cultural needs of a more or less wide area. The central places were determined by Schlier on the basis of a selected list of persons engaged in occupations which can be classed as definitely centralized services in Germany. These places are shown in Fig. 50 (p. 281).

THE URBAN SITE AND PLAN

The Urban Plan. The plan of the medieval town was closely adjusted to the topography of its site. Particularly was this the case when a settlement evolved slowly. The town invariably lay on land free from flooding or above marsh level, for the great majority of towns lay on the banks of a river. Walls were adjusted to the relief, being sometimes built along the edges of the steep slopes of a hill or promontory, sometimes ringing in land that was slightly raised above marsh or flood level, sometimes confined to one easy exit from a promontory formed by a deeply entrenched meander (Fig. 29c). Streets were adjusted to the relief, and were articulated along the most gradual slopes (along the contours) so as to ensure the greatest ease of buildings and movement. But the plan of the medieval town—that is, the articulation of its streets, and the siting of its public buildings and monuments—was also adjusted to the direction and position of its main routes, its main central market place, or its initial nucleus—cathedral, abbey or stronghold. Growth from such a nucleus may have proceeded by gradual development from house to house along existing trackways, or by planned extension along streets that, at any rate in part at the centre, were laid down in advance with the blocks subdivided into building lots. The main routes, however, formed the skeleton of the plan, and these, often of ancient date, once fixed by a river crossing or by a particular adjustment to local topography—following a ridge of higher land or avoiding a marsh—became axes of growth for the expanding town. Such adjustments are especially clear in the small town.

The planned town began as a settlement with elementary urban privileges, but if it was an active centre or one in which the founder took a particular interest, it soon acquired full town status. The planned settlement may have been confined to the market and one or two streets or blocks, growth from this nucleus proceeding more gradually. In many cases it did not grow at all, and the amorphous plan we see today is evidence of an enterprise that misfired. In the case of settlements that were laid out in their entirety, as in the towns of eastern Germany, the whole street plan and the enclosing wall were demarcated at the outset. But the nucleus in which the first buildings were erected lay around the market place, and growth took place outwards towards the walls.

The kind of site selected for the establishment of an urban settlement, or on which such a settlement gradually evolved, has depended throughout history on the primary functions of the settlement. From this point of view, these functions may be regarded as politico-cultural and economic. The religious institution or the stronghold seeks the prominent hill site or the raised hill or promontory, surrounded by sea, river or marsh, which dominates the surrounding countryside and has natural defences. The economic community needs contact with the main routes, and space in which its habitat may expand, and favours sites that are on lower-lying, flatter land, situated where overland routeways converge. Gently sloping ground at a crossing over a navigable waterway is a particularly favoured urban site in western Europe. These two primary functions, one on a hilltop, the other below it in a valley, are often eventually combined to form one settlement. Such was the case in the older Greek city, in which the town is clustered on the slopes of the Acropolis (in the Greek colonial city both were combined in the town walls on a sea-promontory). This growth is commonly represented in western Europe by the cathedral or secular stronghold—or both—situated on a hill or raised ground, and the newer nascent, urban community, that lies at its feet on the lower ground in contact with the routeways. Thus, in France, we have the *Haute-Ville* and *Basse-Ville*, and in Germany the *Bergstadt* or *Talstadt*, or *Oberstadt* and *Unterstadt*. In the later Middle Ages it is represented by the feudal castle situated on an isolated site with good natural defences. The fully grown, independent urban community, instead of being dependent on the stronghold, took care of its own defence and erected and maintained its own walls; in smaller towns this was often the task of the lord or his local representative. In the modern era, since the sixteenth century, with the exception of those places that are situated at important strategic situations, the surrounding wall is no longer necessary and military protection is the duty of the State. Even in the Middle Ages the existence of a strong State control or of geographical isolation likewise made it unnecessary to build walls round urban settlements, or the walls in existence early fell into decay. This was the case in England, and on the Continent there are areas, such as Bavaria and the Tyrol, in which urban settlements were granted the elementary privileges of self-government and were not walled; in other words, they remained unwalled market settlements.

The Site. There are certain kinds of sites that are repetitive among the numerous small towns that cover the countryside. These repetitive groups are clearly related to the general physical character of the land. As far as the larger modern towns are concerned, it is the site of the historic core within the initial town walls with which we are concerned.

Sites were chosen in reference to routes and frontiers, and the immediate topography of the site was selected according to the facilities it offered for natural defence or contact with natural routes and for obtaining from well or spring an adequate water supply.

The following is a classification of the sites of the historic towns. It is adapted from that submitted by W. Geisler in *Die Deutsche Stadt*. It is not to be regarded as a series of pigeon-holes into which every town site can be neatly placed, but a general indication of the way in which town sites are related to each other and differentiated from village sites.

Level Sites (Flächenlage). This is flat land without any breaks in local relief.

- (a) *The Plain Site* is level terrain. Such town sites occur in the heath, peat and marsh lands of northwest Germany; in clearings in the forested valleys of eastern Germany; in the lowland bays, around Leipzig, Münster and in the Rhine Rift valley.
- (b) *The Plateau Site* occurs on mature plateau surfaces, such as the high-level plateaus of central Germany—the Harz, the Thuringian uplands, the Erzgebirge.

Hill Sites include all those sites which are raised above the level of surrounding land. The majority are to be found in central and southern Germany. They are very rare in the northwestern lowlands—a notable exception being Lüneburg, whose castle nucleus is perched on a chalk outcrop—but occur occasionally in the hummocky relief of the Baltic morainic uplands.

- (a) *Hill Slope Site* is the most frequent, and is sometimes associated with a medieval castle perched upon a hill-top. Defence against man and floods were the conditioning factors in the choice of this site. It is frequent in southern Germany.
- (b) *Hilltop Sites* are numerous and are associated *par excellence* with the site of both the medieval castle and the walled town. This kind of site includes both the castle and the town on the hill-top and is quite distinct from the hill slope site. It also is frequent in southern Germany.

Depression Sites (Tiefenlage) embrace those sites which consist of a definite hollow, in which the town is placed. These depressions differ in size and depth, and this is the basis of their subdivision. This was one of the most favoured sites in the Middle Ages, for it afforded not only shelter from cold winds, and a fresh water supply, but, as has been stressed by Gradmann in his studies of south German towns, had the advantage of a downhill journey for a loaded cart going to the town market, i.e. this site afforded a convenient market location.

- (a) *The Nest Site (Nestlage)*, so designated many years ago by Schlüter in his study of northeast Thuringia, where it is particularly frequent, is most common in areas of moderate relief, and is typically formed by the convergence of two river valleys. It is frequent in the Erzgebirge and the Harz Foreland, e.g. Halberstadt; and between the Harz and the Thuringian uplands. In the Münster Bay, the Haarstrang and the Hellweg, which areas are characterized by pervious rocks, often with a drift cover, and an undulating topography, the Nest Site is very common, the depression being

some 50 to 100 feet deep, and reaching down either to a stream bed or to a spring line. Such sites are found along the Westphalian Hellweg, as for example at Soest.

- (b) *The Re-entrant Site (Nischenlage)* is intermediate between the former and the Trough Site. The town is closed in on three sides, and has a free exit only at one point, e.g. a short side tributary, or a re-entrant opening on to a lowland. It occurs in the same kind of country as the Nest Site, and there are many good examples in the Rhine Massif.
- (c) *The Trough Site (Muldenlage)* is a bowl-shaped depression, which occurs in hilly country. The town is enclosed by concave slopes with the town actually sited on flat land; it is often surrounded by hills, which are separated by cols. This site was especially favoured by the medieval town on account of its shelter.
- (d) *The Cauldron Site (Kessellage)* is a still deeper trough form, and the surrounding hills are higher and the slopes still steeper; it is thus completely cut off from lower land. This is a very unfavourable site for a town, because of its lack of natural nodality. Yet several big towns have such a site, e.g. Stuttgart. In the Sudetes there are many small tectonic troughs with such town sites, e.g. Görlitz and Waldenburg.

Valley Sites. While villages are more frequently placed in relation to water supply, shelter, and contiguity to the village fields, towns occur more frequently in relation to rivers. The town sought proximity to the route, by the navigable river or along its valley, and river crossing points, by ford, ferry or bridge. The valley sites are especially typical of the northern part of France and the lowlands of England. But this classification cannot be consistent if it is now based on function, e.g. ford, pass, bridge-head, etc. It must adhere strictly to the idea of the conformation of the terrain. Sites in this class lie at natural river crossings, where roads converge, and raised land above the lands liable to flood along the river plain.

(1) *Long Valley Sites (Längslage)* include all those sites which are found along the floor of a narrow valley floor. They are extremely common, particularly owing to their relation to the valley routes. They may be grouped according to the form of the valleys.

- (a) *The Valley Route Site (Talstrassenlage)* reflects a simple relation to the course of the river. It occurs in long narrow valleys, as in the German uplands, and in rejuvenated plateaus. Many long "forest" villages, which have become towns, have this form. It is also found in the towns of the Rhine gorge, e.g. Boppard.
- (b) *The Valley Floor Site* occurs in valleys with broad flat floors. It is found in the north German glaciated troughs and the Bavarian Plateau, and some of the towns of the Rhine Rift on the Rhine and its tributaries. It appears on the Rhine at Cologne, Düsseldorf, Duisburg and Ruhrort. Lower down the river, the sites resemble the glacial trough sites, noted below.
- (c) *The Step Site* is marked by a steep bluff overlooking the river. This is usually an old river terrace, though it may be formed by a break of slope due to a change in geological outcrop. It offered both a good strategic

position and it is also near to a river crossing, which was well adapted to the construction of a bridge. (The term Terrace Site is not used, since this is reserved for a later category.) Good examples are the *Altstadt* of Kassel, sited on a limestone platform, overlooking the Fulda, and Naumburg, sited on a terrace some twenty metres above the great expanse of valley flats of the river Saale. The site, indeed, is common to many of the towns which were established on the west bank of the Elbe and the Saale as outposts of trade and Christianity against the Slavs; for they enjoyed the dual advantage of good trade connections across the river and a site with good natural defences and a wide view to the east, over the surrounding country, e.g. Magdeburg, Meissen, Naumburg.

- (c) *Transverse Valley Site (Querlage)* is formed by a topographic irregularity or a tributary valley transverse to the lie of the main valley. It includes the *Valley Fork Site*, in which the town spreads to cover the floor of the two valleys, in a V-shape (not within the confluence). It is common to many towns in the Black Forest.
- (d) *The Valley Exit Site (Talausganglage)* is formed where a valley opens on to a lowland, the border of the lowland running athwart the valley. The type is characteristic of residual ridges of the middle Weser country, of the borders of the Harz, e.g. Goslar, and especially at the edges of the Rhine Rift valley, at the foot of the Vosges and Black Forest, e.g. Heidelberg.
- (e) *River Meander Sites* fall into three groups, in each of which the prime cause in the selection of the site for a town was the supreme advantage of a good natural defence, which was considered in preference to the advantage the route connections of river or roadside location.

(2) *The River Loop Site* is surrounded by water on three sides, and has only one direct land connection, across the head of the loop. The latter may be commanded by a castle. This site embraces all grades of terrain from the broad meander, with gently rising ground, to the deeply entrenched meander. Classic examples are Berne and Freiburg in Switzerland.

(3) *The Spur Site* has gently rising ground between two converging rivers, e.g. Passau and Koblenz.

(4) *The River Island Site* occurs either in nature or through the construction of a channel by man so as to complete a natural girdle. Such terrain occurs only in lowlands with rivers which are both graded with wide meanders. It is frequent among early towns, since it offered direct contact to main trade routes, especially river crossings, but could also be relatively easily strongly defended. It occurs along the Hellweg river crossings in lower Saxony, e.g. Brunswick, Hanover *Neustadt*, and in some of the Baltic coastal towns, as at Lübeck, and in water-girt islands in the wide valley troughs of eastern Germany, as at Posen and Breslau.

Lake Sites. These sites are most commonly found where lakes are most frequent, namely in the glaciated areas of northeastern Germany, east of the Elbe, and in the Bavarian Plateau. Such sites afforded good natural defences, often level land in closely undulating country, and a food supply in the form of fish from the lake. But such sites are usually cut from contact with the old roads and

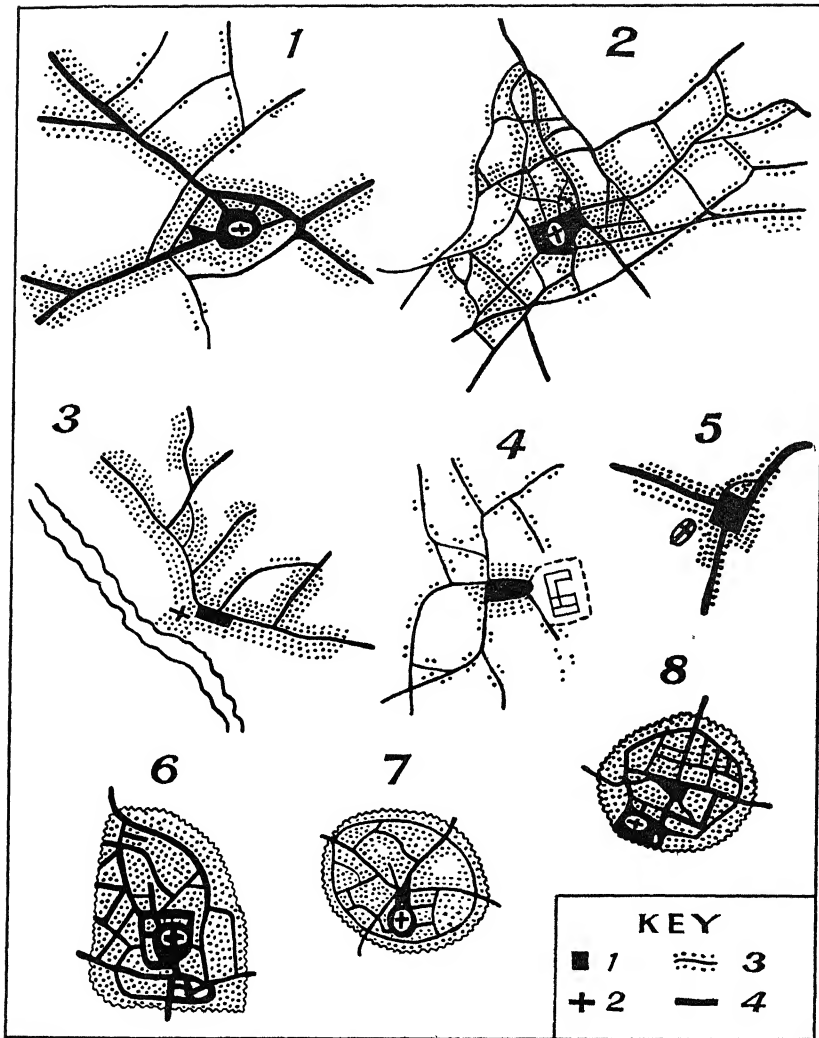


FIG. 29A—THE PLAN OF THE MEDIEVAL GERMAN TOWN. I: RADIAL PLANS (from Martiny)

1. Market place
2. Church

3. Buildings on the street plan
4. Main roads

For further details see text on p. 182.

the modern railway, and many towns have stagnated economically, though they retain intact their medieval aspect. The lakes and streams were not used for navigation. The lakes are shallow and often bordered by swamp, and are being rapidly silted. According to their position on the lake, these may be classed as Shore and Peninsula Sites,

Coastal Sites. This group is relatively unimportant and does not include many towns. Many places which were medieval ports have already been noted, since other site factors were far more decisive in siting than position on an open sea front. "All towns have sea sites which receive a definite character with respect to their build and aspect through their location on the sea" (Geisler, *Die deutsche Stadt*, p. 407). This definition greatly reduces the range and number of towns with such sites. Open sites are those in which the towns lie on a smooth coastline along the sea front. Owing to their lack of natural nodality they are very few in number. River-mouth sites occur occasionally in medieval towns, notably on the coast of Pomerania, e.g. Swinemünde. Medieval towns engaged in seaborne trade sought bridge-heads, well up the navigable rivers, so as to be as near as possible to the land routes of the interior, and their actual sites fall into one of the above categories.

TYPES OF HISTORIC TOWN

Types of town may be recognized according to the arrangement of streets, market place, open spaces, house lots and public buildings. Moreover, in accordance with their plan and build towns fall into families with marked affinities that vary from one part of the country to another. There are two general modes of urban growth: one is a radial growth from an oval-shaped nucleus, that normally began as a secular or ecclesiastical stronghold; and the other is linear growth from one or more route axes. Such growth may be either the result of slow unplanned growth or of deliberate planning by some high authority.¹

The oval nucleus with a market place outside it and a radial arrangement of streets is found in many of the oldest towns, especially those that began as defended bishops' seats. It is also found in other towns of later date that began as fortresses and outside which the urban settlement later grew *in suburbio*. Radial plans are shown in Fig. 29A. The small country town or *Flecken* often grew gradually from an irregular village nucleus (*Haufendorf*). This form is frequent in northwest Germany. Church and castle are, however, more important as nuclei of growth, appearing in the plan as an irregular oval-shaped nucleus (Fig. 1, St. Tönitz, near Krefeld). In unplanned towns, the market place is first held on the street or near the church (as in Fig. 1) and the market place is enlarged at a later date (Fig. 2, Meldorf in Dithmarsch). A planned elongated market place is established as a development from the simple street market at an early date in many settlements alongside the side and main route (Fig. 3, Kettwig on the Ruhr). Figs. 4 and 5 are small planned towns, the first (Ebersberg, near Munich) being characteristic of old Bavaria, the last (Hartenstein in the Erzgebirge) of northeast Germany. Fig. 6 (Dambach in Alsace) is a rare type that evolves through the gradual

¹ See the author's *The West European City*, 1951.

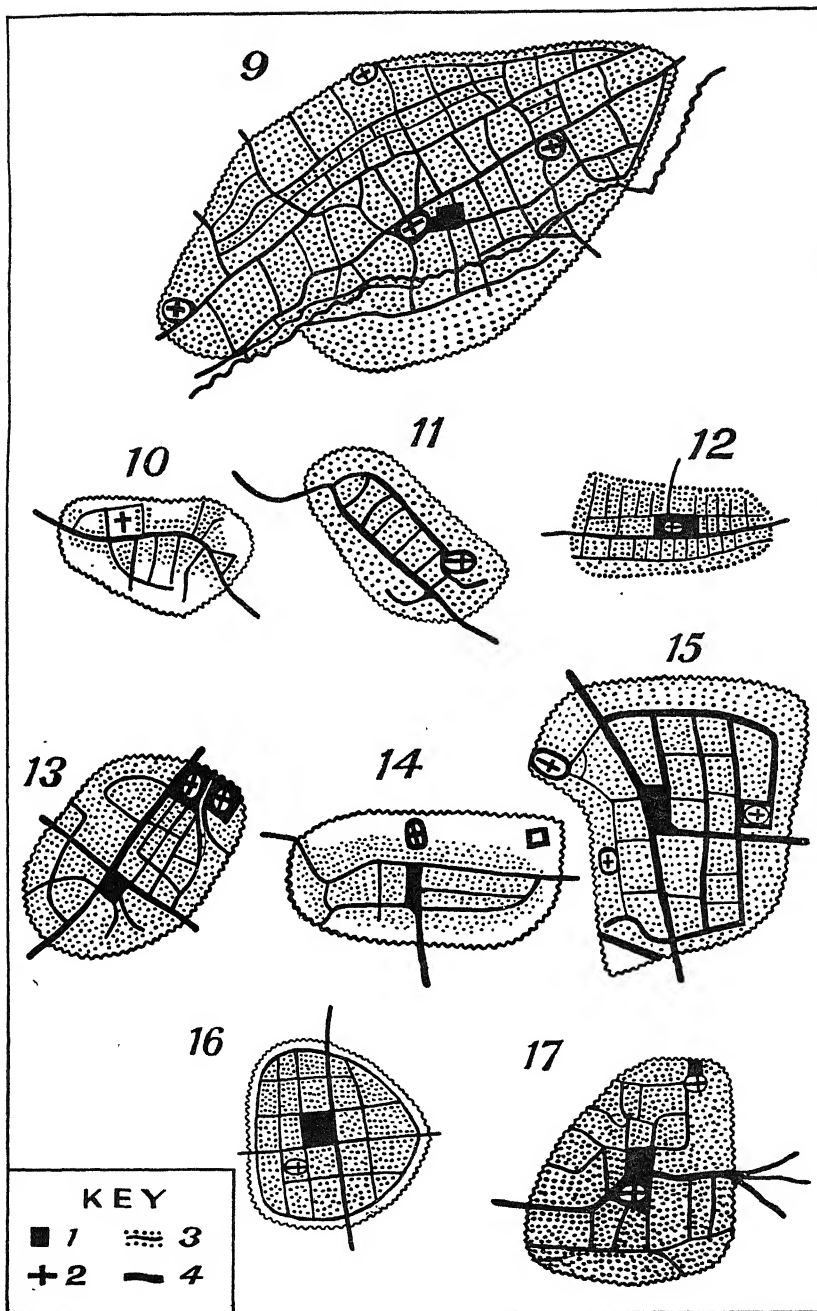


FIG. 29B—THE PLAN OF THE MEDIEVAL GERMAN TOWN. II: AXIAL AND GRID PLANS (from Martiny)

1. Market place 2. Buildings on streets 3. Church 4. Main roads

For further details see text on p. 184.

transformation of a *Haufendorf*; it is fairly common in the Rhinelands. Fig. 7 (Haltern) has an irregular radial plan of natural growth and is markedly contrasted to the regular radial plan of Iserlohn (Fig. 8). Haltern grew from an old church centre in the Münsterland and the church is the centre of the plan with the market place next to it; this is the prototype of the cathedral stronghold such as is found at Münster, Halberstadt, Paderborn, etc. Iserlohn has grown by rectilinear extension from its intersecting route axes.

The second main group are the towns that have a central route as the main axis of their growth. (Fig. 29B.) Fig. 10 is the simplest type, in which one highway and narrow side streets form a rib plan (Kienzheim near Kaisersberg). Further growth from such a nucleus necessarily results in the development of right-angled and parallel streets, as at Goslar (Fig. 9). Regular arrangement of streets on this plan indicates a planned form as at Fig. 11 (Mühldorf on the Inn), characteristic of many towns in Bavaria, and Fig. 12 (Heidelberg), a rib plan with a rectangular market place alongside the central axis. The intersection of two rib plans is found at Isny (Fig. 13), a type that is common and peculiar to south-west Germany (see Rottweil, Fig. 29C, and Ochsenfurt, Pl. 9). The parallel street plan has several wide, parallel main streets and narrow interconnecting streets at right angles to these, and buildings *front* on the parallel axes. The market place may lie along and parallel to the main axis (*Längsmarkt*) as at Leipzig (Fig. 15) or be at right angles to the main axis (*Quermarkt*) as at Stadthagen (Fig. 14). An approximate grid plan may develop by natural growth in this way. The grid plan proper, however, is a planned form with a combination of rectangular blocks intersecting streets of equal width and a central square market place (*Zentralmarktanlage*). Such a rigid plan is found at Koslin (Fig. 16), a type (*Kolonialstadt*) that occurs over large areas of the colonized lands of eastern Germany, Poland and Bohemia. The layout of such a plan may be crudely arranged; or it may not have extended beyond a few blocks and a market place; or it may have been adjusted to existing elements and to the walls. Thus, at Naumburg (Fig. 17), on the west bank of the Elbe, the crude grid plan of the town proper lies between, and is adjusted to, a through east-west route and the cathedral stronghold. Such growth was common to many of the old towns along the frontier zone of the Elbe.

In the Baroque period, relatively few towns were founded but they were deliberately planned according to principles which are well known from contemporary records. The town was usually erected as a fortress or a residence and there is a regular geometric layout of streets focused on a residence or military focus and in relation to the bastioned fortifications. Neustrelitz (Fig. 29C) is such a town. The best known are Mann-

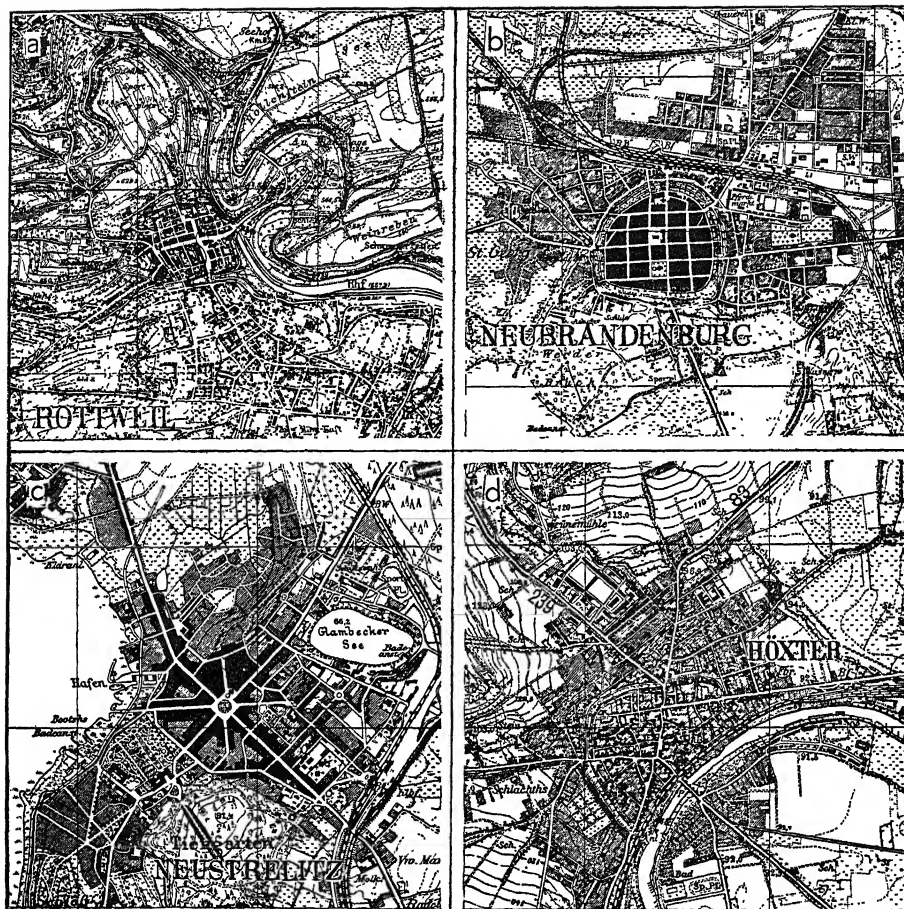


FIG. 29c—TOWN TYPES

(a) ROTTWEIL in Württemberg. Founded town with intersecting axes and quad-rangular wall. The old town (*Altstadt*) lies to the S.E. Common planned form in South Germany.

(b) NEUBRANDENBURG in Mecklenburg. Founded town with grid plan and circular fortifications. Latter replaced by boulevard with modern extensions beyond them.

(c) NEUSTRELITZ in Mecklenburg. Typical 17th-century Baroque foundation, with radial lay-out and central rectangular market place.

(d) HÖXTER on the Weser in North Rhine Westphalia. Irregular plan through un-planned growth from a *Haufendorf* nucleus.

heim (rectilinear) and Karlsruhe (radial from a royal residence), but there are numerous lesser-known cases, planned as new towns or as extensions of old ones—Bonn, Erlangen, Glückstadt and Saarlouis are examples. The majority of the houses in the historic town also date from this period.

Four small-town types are shown on Fig. 29C. See also Pls. 9 and 10.

THE PHASES OF MORPHOLOGICAL GROWTH OF THE MODERN TOWN

The expansion of the German, as of the west European town in general, is divisible into several phases. The first was marked by the appearance of the town as a compact settlement unit with its focus in church or market and its limits in the wall. On the Continent, the wall was an almost invariable accompaniment of the town, whether large or small. The larger town grew by stages, and the last walls in fortress cities were the bastioned structures that appeared in the sixteenth and seventeenth centuries after the changes in siege warfare introduced by gunpowder and artillery. Towns seldom reached these walls, and there was little growth beyond them except outside the gates on the main road. After the great devastations of the Black Death in the fourteenth century the population of most towns remained stationary for several centuries. The changes they experienced were mainly of an architectural kind—new public buildings, embellishments of the old, the construction of domestic buildings, and in particular the erection of mansions for city burghers and landed gentry, both in the town and on its immediate outskirts, both inside and just outside the walls. A good many towns were extended as the seats of the heads of small states in Germany, and such deliberate extensions were usually marked by a grid plan grouped around the royal residence. Other towns were established as fortress centres, and still others as mining centres, as in Erzgebirge: but these were new towns, and, like the medieval towns, they served as the cores of crystallization for the subsequent growth.

The third phase of urban expansion is associated with the Industrial, or Modern Machine Era. It is marked by the greatest increases in population the Western world has experienced, and above all by the great concentration of people in urban agglomerations. In this process of growth during the nineteenth century certain events were of decisive importance. An early phase of growth was caused by the advent of the steam-engine, followed shortly afterwards by steam-driven machinery. This brought into being the steam-driven factory, which appeared on the Continent at various dates during the first decades of the nineteenth century, though very slowly and on a small scale as compared with Britain. The new factories were normally outgrowths from old water-driven factories and grew up on the same sites. They were on low flat

land, usually near a river, and almost always in or next to the built-up area, usually within the town walls. New factories grew out of old; they expanded, and workers' homes had to be built next to them. The spread of the urban areas in Germany in this phase was slow, as is evidenced by the relatively slow increase of town populations down to 1850.

A later, and the principal, phase of growth is introduced by the advent of the railway, which marked the first real onset of urban growth and expansion on the Continent. There was a rapid concentration of people in the towns. These could only expand along the railway routes. But such linear expansion was not in fact very marked, since there were only two or three railways, except in the largest cities. There was, in fact, during this period, no rapid local and universal transport within the urban areas. The horse-drawn tram did not appear till about the middle 'sixties and the 'seventies, and even then its rate of progress was not much quicker than a walking pace. Consequently, the new urban areas were necessarily compact, and builders sought to erect houses as close as possible to the existing town and its factories, and with the highest possible density.

During this period on the Continent the walls became a serious barrier to expansion and traffic. They were demolished, and their place was taken by great wide circular boulevards lined with public buildings. These boulevards are not merely streets. They are avenues with vistas of great buildings and social promenades for the people, an invaluable asset to urban life in which the British city is almost entirely lacking. Some great new thoroughfares were cut through the old city of Paris by Haussmann in the 'fifties. The same idea of wide thoroughfares and circular belts inspired the city planners of the last decades of the nineteenth century, as is evident in Cologne (Fig. 75, p. 471), Vienna and Budapest, to name but three. Unfortunately no attention whatever was paid to the control of housing, and the private speculator, conforming to the existing street plan and the demands of local by-laws, was able to build vast tenements in the building blocks, housing as many people as possible in congested barrack-like flats.

The next phase begins towards the end of the century, but it is short, and ceases in effect with the First World War. It was marked by several changes which permitted the wider expansion of the urban area, and by the imposition of new building regulations brought about better housing. The electric tramway enabled the city to extend. Regulations forbidding the entire building-up of blocks with tenements, and the spread of better housing ideals, notably the "garden-city" conception, resulted in some better-class housing. But this phase was short and the built-up areas dating from it are much smaller in extent than those of the first or the third periods.

The final phase is the post-1919 period, which is marked by the advent

of the motor-car, the motor-bus and the surface or underground electric railway to the means of urban transport. It saw the advent of electricity and the growth of a range of new light industries. It is an era of outward movement of persons from the city to new homes in the outskirts, and of industry to more spacious and cheaper factory sites. All these traits had appeared before the war of 1914, but they were combined after 1919 with the tremendous demand for new houses, to bring about the definite "explosion" of the city and its wide geographical expansion, and the formation of a city business core (German, *Citybildung*).

It will then be apparent that every large German city reveals a crust-like growth from its centre in which, in its topographic and architectural formation, four phases can easily be recognized. These are, the medieval nucleus within the final walls, the Renaissance and Baroque extensions from about 1500 to after 1800, the nineteenth-century expansions from 1800 or 1850 to about 1914, and the inter-war period from 1919 to 1939. The layout of these German cities was favoured by the clear limits which the walls imposed on the successive phases of expansion of the built-up area and by the belts of open land alongside the fortifications which, when demolished, provided open sites for the erection of public buildings and magnificent boulevards. Moreover, the existence of such a belt meant that the railway stations had to be built there or just outside, and certainly not in the old town area itself—a fact which helped to relieve congestion in the city centre. Also, with the full advent of the industrial era in the second half of the nineteenth century, factories had to be located on the outskirts of the city, though some were built on open spaces inside the wall and along river fronts.

THE LIMITS OF THE URBAN AREA

The urban agglomeration cannot be interpreted adequately as a mass of materials or in terms of dead patterns. It must be interpreted as an organic part of a social group. Every urban settlement forms part of an economic, social, cultural and political unit, upon which its development depends, and all these relations have geographic expression. From this point of view, certain facts are outstanding as fixing the limits of the urban area. Chief of these is the limit of the urban built-up area. This is a very ragged fringe in which rural and urban activities and land uses are intermingled with the main extensions along the routeways. The urban influences extend outwards through the establishment of urban structures on the periphery, and especially through the centrifugal expansion of urban workers' homes. The ragged edges of the urban tract, as this whole area may be called, merge gradually into a zone that has intimate social and economic relationships with it. This is the area of regular

city deliveries and of daily movements of people from their "sub-urban" homes to the city for business and shopping and to the industrial districts and elsewhere for their daily work. It is in effect the *urban or city settlement area*. It is marked by a steadily rising population (as opposed to a slow increase or decrease in the urban area and a decrease in the rural areas on the outermost fringes) and by its relatively high density of population as against the rural areas encircling it. A large proportion of its residents is engaged in daily work in the urban area and in factories in its vicinity. Accessibility is the primary determinant of these areal relations and geographers have paid much attention to the preparation of isochronous maps showing zones of equal time accessibility to selected points in the city centre. Beyond this settlement area again there is a wider area which is mainly oriented towards its local towns, but has occasional contacts with the distant city which functions as its regional centre. This may be called the *city-region*. Many German geographical studies on all these aspects of city life have appeared in the inter-war period.¹

¹ The following examples of urban growth will be found in later chapters—Hamburg and Bremen, Ch. 20, Berlin, Ch. 26, Cologne, p. 469, Frankfurt, p. 552.

PART IV

ECONOMIES

*Jeder Wohnraum hat seine eigentümliche Wirtschaftsform, und jeder Wirtschaftsform entspricht eine besondere Wirtschaftslandschaft, die durch Betriebsform und Produktionsziel als gestaltende Kräfte bedingt ist.*¹—Leo Waibel, 1933.

¹ Every inhabited area has its particular economy and every economy is equated to a particular kind of economic landscape shaped fundamentally by the character of the operating units and the aims of production.

CHAPTER 8

GENERAL ECONOMIC DEVELOPMENT AND ECONOMIC REGIONS¹

WITHIN ONE generation after the establishment of the Second Reich, from 1871 to 1914, Germany underwent a revolution in its economic and social structure. In 1871 the country was predominantly rural and agricultural. Industry consisted mainly of handicrafts, pursued in the home and the small workshop, and was little affected by those developments of modern industry, based on coal and iron, which had already profoundly modified the life and face of Britain. These latter changes developed slowly in Germany in the third quarter of the century, and then set in at a prodigious rate in the 'seventies, so that in the years immediately preceding the 1914-18 war Germany rivalled Britain in the fields of industry and commerce, and had experienced tremendous changes in the character and scale of its economic and social life and organization. This phenomenal development of industry and trade in Germany was accompanied by the growth of the population from 41 millions in 1871 to 65 millions in 1913 (1914 area). Geographically, this increase was confined almost entirely to the towns, which were swollen by a steady stream of immigration from the countryside, so that, in 1910, 62 per cent of the population lived in towns and 38 per cent in the country—almost exactly the reverse of the distribution in 1871.

The great increases of industry and urban population brought in their train three other outstanding features. First, the agricultural acreage was increased and production intensified by the use of commercial fertilizers and machinery, the import of animal feedstuffs, and improved methods of cultivation, with the result that, in spite of an increase of more than 60 per cent in the population, home production of foodstuffs was able to meet 80 per cent of the total consumption. The remaining 20 per cent of the total food consumption, however, was an essential and permanent feature of the import trade, consisting partly of essential foodstuffs and partly of luxury commodities. Second, the mobility of goods and persons, effected through the medium of cheap and rapid transport facilities, was an essential counterpart and concomitant of the growth of

¹ These chapters deal with the economic geography of pre-war Germany in its historical development down to the peak of production in 1939 and during World War II. This pre-war pattern of industry, agriculture, and trade, will serve as a basis for the evaluation of the adjustment of post-war Germany to new conditions. (Ch. 15.)

industry and urban population. A great increase in the volume of internal commerce, effected over a dense network of transport arteries, both railway and waterway, was accompanied by a great increase in the numbers of persons engaged in trade, transport and administration, occupations which are mainly concentrated in the cities. Thirdly, industry became increasingly dependent upon foreign supplies of raw materials, which Germany did not possess in sufficient quantities, or which she could not produce at all for climatic reasons. The import of vegetable products involved in particular a dependence upon the equatorial lands. Further, German industry depended increasingly on the export market for the disposal of its growing volume of products. German foreign trade before 1914 was characterized by a nice balance in tonnage of exports and imports, based, like that of Britain, on a large bulk export of coke and coal and quantities of valuable manufactured products, and the import of bulky raw materials and foodstuffs. Moreover, German manufactured goods were both good in quality and cheap in price. Consequently, Germany absorbed a small but ever-increasing proportion of world trade, and dominated in particular the foreign markets of central and south-eastern Europe. In the period 1880 to 1913, the foreign trade of Germany increased from 129 to 310 marks per head of population.

This development of modern Germany was facilitated by the abolition of the outworn medieval organization of rural life and industry, that still prevailed during the first three-quarters of the nineteenth century; by the construction of the railway net; by the erection of the Zollverein, or customs union, which substituted a single trade unit for the many tariff frontiers of the separate states; by a unified financial system; and, basic to all these things, by great resources of coal and iron ores, for "the German Empire was built more truly on coal and iron than on blood and iron."¹

In 1860 Germany's coal production amounted to 12·5 million tons, together with 4·5 million tons of lignite. At this time the production of France was 8 million tons, Belgium 9·5 million tons, and Britain 81 million tons. In 1873 German production of both coal and lignite was doubled and more than twice as large as that of France and Belgium, but a quarter that of Britain. In 1914 Germany produced 191 million tons of coal and 87 million tons of lignite, as compared with 292 million tons of coal in Britain. In 1860 Germany's production of iron ore amounted to only half a million tons, as compared with 4 millions in Britain and 1 million in France. Production of iron ore was greatly increased by the opening-up of the Lorraine field and in 1914 German iron-ore production reached about 28·5 million tons. In the period 1871-5 the output of pig-iron was 2 million tons per year, as com-

¹ Keynes, *The Economic Consequences of the Peace*, p. 75.

pared with 6.5 million tons in Britain. For the period 1911-13 the average figures were 17 million tons for Germany and less than 10 million tons for Britain. Germany, as a single economic entity, had become an effective rival of Britain as an industrial nation. She had also become a colonial Power. The interests of Britain and Germany clashed, and it was on a wave of economic prosperity that Germany entered the First World War in 1914.

After the 1914-18 war, Germany lost mineral and food resources upon which the balanced economy of the Reich was founded. She lost about 12 per cent of her total area, 12 per cent of her population (of whom 60 per cent were Germans), 12-15 per cent of her agricultural production, 10 per cent of her manufacturing capacity and 75 per cent of her iron-ore production. Twenty million tons of iron ore were lost in Lorraine, the development of which was closely related to that of the Ruhr. In the Saar, she lost about 12 million tons of coal per annum. In Upper Silesia, she lost an annual coal production of some 25 million tons, and 70 per cent of her zinc and 25 per cent of her lead. Altogether she lost 35 per cent of her annual pig-iron, and 30 per cent of her steel, production. In Posen and West Prussia she lost about a tenth of her production of grain (mainly rye) and one-sixth of her potato crop. Lastly, she lost all her colonies, nearly 3 million square kilometres in area, with a population of 12 millions.

In spite of the catastrophic decade from 1914 to 1924—marked first by the war and the blockade (1914-19), the war losses, and then the financial collapse in the early 'twenties—Germany had almost reached the pre-war level of production by 1925. During the late 'twenties she enjoyed a period of internal reconstruction and relative prosperity marked by a growth of production and foreign trade well above the 1913 level.

Following the boom of 1927-9, came in 1930 the Great Depression. From 1928 to 1932 the national income fell from 76 milliard to 45 milliard marks. Industrial production was reduced by almost a half. Employment fell from 18 millions to 12.5 millions in the same period. Unemployment in the beginning of 1933 probably reached 7 millions. Imports were reduced by a third and exports by a half. Agriculture was in a critical condition. In 1932-3 agricultural income had fallen to the lowest point since 1913.

Germany was in the very trough of the depression when Hitler came to power on January 30, 1933. The country had to be revived from its economic plight. The National Socialists had two main objects in their economic policy: first, to abolish unemployment—this was the main purpose of the first five-year plan, announced in May 1933; second, to organize the economic life of the nation on a war basis—this was the object of the second five-year plan. In September 1938, at the end of the

first five-year period, unemployment in the usual sense of this term was negligible, owing to labour camps, conscription, rearmament, etc. The second five-year plan aimed at *Autarkie* or national self-sufficiency, that is, the greatest possible measure of self-sufficiency, so as to enable the country to withstand a war-time blockade. Vast sums were spent on the improvement of agriculture, so as to make the country independent of foreign foodstuffs and animal feedstuffs. In the industrial field, natural resources were developed to their utmost, and lavish subsidies fostered the development of new industries and the creation of substitutes for imported raw materials, such as rubber and textiles. Foreign trade (the total of imports and exports) from 1933 to 1938 was low in value—below 9 milliard marks per annum from 1934 to 1936—but then increased slightly in the next two years, owing to an intensive trade drive. Tonnage figures, however, tell a different story, for the total tonnage of foreign trade in 1938 was 50 per cent greater than in 1933. After 1933, imports of foods and raw materials were reduced and imports were concentrated as far as possible on those raw materials which were essential to the rearmament industries. The State controlled foreign trade and its transactions, bargaining with those countries which would barter German goods for their raw materials and foodstuffs. Under such rigid State control, Germany became an armed camp and World War II inevitable.

Thus, between the wars, Germany experienced two periods of great economic activity, in which the 1913 level of production was exceeded, the first in the late 'twenties, the second in the late 'thirties. The fundamentals of the economic structure, however, as laid in the fifty years of the Second Reich, and as essentially based upon the natural resources of the country, were the same in 1939 as in 1914. The basic features of this structure are summed up in the growth and distribution of population as between town and country, and the proportion of the main occupational groups. In 1871 the total population (in the 1918-37 area) amounted to 36 millions; nearly two-thirds lived in the country and over one-third in towns. In 1910 the total population was 58 millions, with 38 per cent in the country and 62 per cent in the towns. In 1933 (including the Saar), out of a total population of 66 millions, 33 per cent lived in the country and 67 per cent in town (p. 97). The changes in the economic structure associated with this great growth of population and the great concentration of the population in towns are summed up by the statistics of occupations, as shown in the table on the next page.

The great predominance of industrial over agricultural occupations is misleading and it would be wrong to compare pre-war Germany in this respect with such highly industrialized countries as Britain and Belgium. A very large number of German peasant farmers—especially in Württemberg, Baden and Thuringia—are obliged to eke out their slender existence

by doing some kind of industrial work, either in their houses or in a factory. Consequently, agriculture is more important as a means of living than the crude figures given above would signify. For the same reason it is extremely difficult to determine just how many people are fully engaged on agriculture as a main occupation. The main fact is that there has only been a slight decrease in the numbers fully dependent on agriculture in the last fifty years, during which period the German land has been able almost to keep pace with the greatly increased demands for food from its urban populations, in contrast to Britain and Belgium, which are fed mainly by imported food supplies.

Occupations in Germany (territory as in 1918-37)

	1882		1907		1925		1933		1939	
	Nos. (mill.)	%	Nos. (mill.)	%	Nos. (mill.)	%	Nos. (mill.)	%	Nos. (mill.)	%
Agriculture and Forestry ..	15.9	40.0	14.9	27.1	14.4	23.0	13.7	21.0	12.2	18.1
Industry and Handicrafts ..	13.9	35.0	22.4	40.7	25.8	41.3	25.3	38.8	27.6	40.9
Trade and Transport ..	3.9	9.7	8.2	14.9	10.5	16.9	11.1	16.9	10.7	15.9
Population ..	45.0	100.0	55.0	100.0	62.4	100.0	65.2	100.0	67.4	100.0

Industry had twice as many dependants in 1939 as in 1882, although the proportion to the total population has increased by only 4 per cent. In this period, Germany emerged as one of the great countries of large-scale industry. But this change has not killed the handicrafts, which were the basis of its industrial life in 1870. The farmer or peasant-craftsman is especially characteristic in Germany, as he is rare in Britain.

The trade and transport group reveals the largest increase from 1882 to 1939 in the numbers of dependants and in the proportion to the population as a whole. The remaining occupational groups—the public services (administration, defence and education), health services, domestic services, persons of independent means and students—increased in total from 15 to 25 per cent of the total population. The absolute and relative increase of these occupations is due to the need for increased commercial and social facilities, which accompany everywhere the increase of specialized economic production and the concentration of population in cities.

Thus, in brief, Germany is one of the greatest industrial nations in the world. Unlike Britain, she has been able to increase agricultural production to such a degree that the bulk of the food supplies for her people were produced within the country. Germany has its agricultural backbone in a large class of peasant farmers. In addition there are many peasants

who carry on some industry as a subsidiary occupation; and in the eastern provinces there were large estates run on commercial lines. But as a great producer of manufactured goods, Germany is dependent in considerable degree upon foreign countries for raw materials and for markets for her goods. Furthermore, she is dependent upon foreign countries for many of the vegetable products which she cannot grow herself and which she cannot supply in sufficient quantities to fill the national demand.

All these features of the economic and social structure of modern Germany came about within one generation. The transformation which set in with giant strides after 1870 had virtually run its course thirty years ago, in 1910, on the eve of the 1914-18 war. The subsequent period down to World War II witnessed no radical changes, either in the distribution of population or the balance of occupations, but a further accentuation of those features which were well-established in the first decade of the century. In other words, the Germany of 1938 was essentially the same as the Germany of 1914, in spite of the trials and changes of the national economy in the last thirty years, for the State, in spite of changes in its organization and policy, had the same basis to its economic structure, and the same needs of materials and markets. These fundamentals formed the background of the 1914-18 war and, in even stronger measure formed the background of World War II. Post-war changes are considered in Chapter 15.

These facts may be expressed in another way by considering the occupational statistics of the states of Germany and her neighbours. In pre-war Germany 20 per cent of the population depended on agriculture, 38.8 per cent on industry, 16.9 per cent on trade and transport, and 15.5 per cent had independent means or were without occupation. In Belgium, Holland and Switzerland there is a similar predominance of the numbers dependent on industry. In Austria the proportions engaged in industry and agriculture are equal. In Czechoslovakia the proportion is slightly in favour of agriculture, but in Bohemia-Moravia there is a great preponderance of industry as opposed to Slovakia, which is primarily agricultural. In France and Poland there is a majority dependent on agriculture. In these two countries are found the extremities of the great industrial area of Europe. In France, the industrial zone comprises the tier of departments along the northern and eastern frontiers from the Channel to the Rhine. In Poland the three western provinces of Posen, Lodz, and Kielce, have a half to two-thirds of their populace dependent on agriculture. They form, together with Upper Silesia, the eastern extremity of the industrial belt, for east of Cracow the high population density in Galicia and the Ukraine is due entirely to close agricultural settlement, and industry is negligible. Similarly there is a secondary industrial zone in the Danube area extending from Upper Silesia, through

Vienna and Wiener-Neustadt to Graz. East of this zone, the industrial population is very small, and is confined to a few great cities, notably Bratislava and Budapest, the latter containing three-quarters of the industrial workers of Hungary.

The extent of the main overall economic areas of western Germany is shown in Fig. 30. These areas are based on statistics of occupations and on the proportions of the rural and urban populations, for the administrative areas of the *Kreise*. This is in large measure a replica of the distribution of population. The area in which agricultural occupations are dominant (Areas 1, 2, and 3) covers about half of the Reich and contains about a quarter of the total population. It corresponds with the areas of the lowest population density with under eighty persons to the square kilometre. In this area from 50 to 60 per cent of the entire population including the small towns is dependent on agriculture, and a similar proportion lives in rural areas, i.e. in villages with under 2,000 inhabitants. In the remaining half of the country, the industrial exceeds the agricultural population. Here, too, the density of population exceeds 100 persons to the square kilometre and here are concentrated the majority of the cities and towns. But within it the density of population and the economic structure vary widely. (Areas 4 to 7.)

The first type of economic region has an average rural density of population of about 30 to 35 persons per square kilometre, and a high proportion engaged in industry and commerce, which together give a livelihood to three times as many people as agriculture. About 40 per cent of the population is rural, the remainder in towns. This type is found in the border zone of the Central Uplands from the Münster Bay to the industrialized upland districts of the Sudetes in Silesia. Its widest extent is found in the middle Elbe basin, where it extends from the Elbe river as far west as the Thuringian Forest. (Area 4.)

The second type is also highly industrialized, but it has a higher agricultural density of population, averaging 40-50 persons per square kilometre—a fact which is to be associated, as noted above, with its exceptionally small farm holdings. This type is found mainly in the Rhinelands and especially in the southwestern provinces. It is characterized by a high density of rural settlement, highly developed domestic handicraft industries, and a concentration of interrelated industries in many urban centres. (Area 5.)

The third type is found in the highly industrialized areas in which there is an average density of agricultural population, but agriculture is completely overshadowed by industry and commerce. These are the great industrial areas of Germany—the lower Rhinelands with its chief nucleus in the Ruhr, Saxony, the Saar, and the small section of the Upper Silesian area that was in Germany. These areas together accommodated

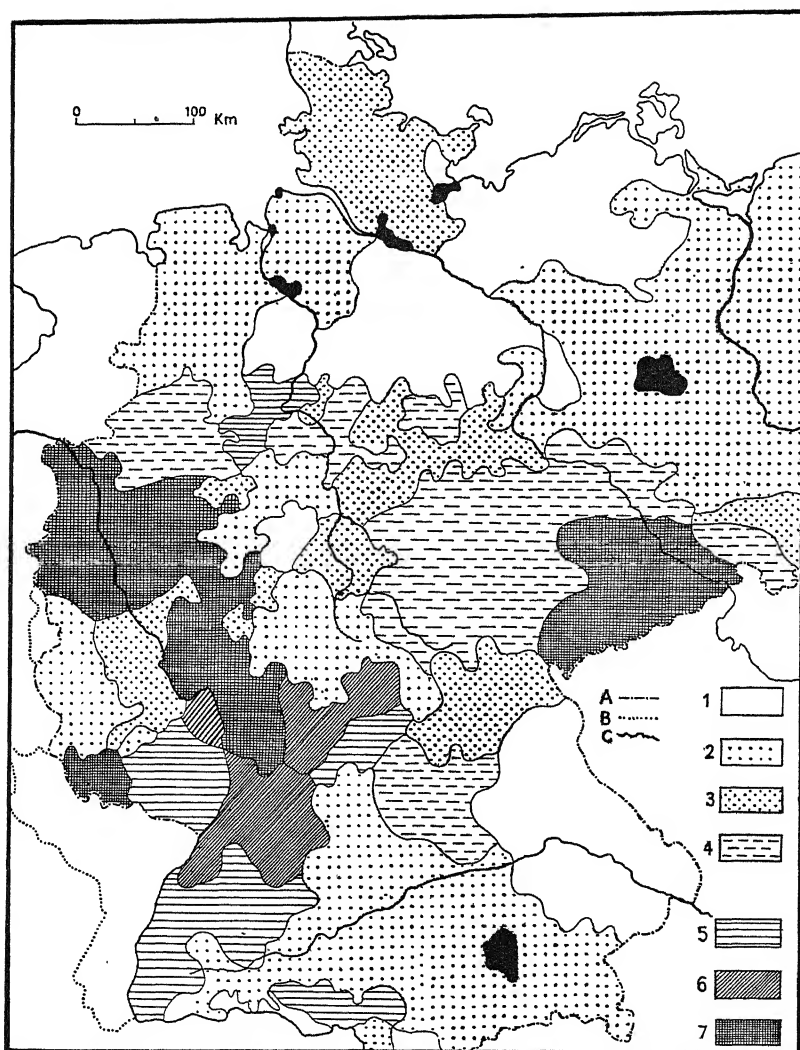


FIG. 30—GERMANY: ECONOMIC REGIONS (*from Volz*) (scale, 1 : 6 m.)

A. Frontiers in 1918

B. Frontiers before 1918

C. Rivers

1. Agricultural

2. Predominantly agricultural

3. Agricultural-industrial (in about equal proportions)

4. Slight industrial dominance

5. Mainly industrial with important agricultural proportion

6. Dominantly industrial

7. Entirely industrial (see text)

some 15 million people, nearly one-quarter of the total population of the Reich on one-tenth of the area. The Ruhr is completely urbanized, with a total population of some 4 millions. Saxony is a land in which the industrial towns are scattered in a rural countryside; the same type of economic structure and population distribution is found in the coal-field of northern France and Flanders. Upper Silesia is an exclusively industrial area. In the Saar, on the other hand, mining and industry are interspersed with farming, and the miner often has a bit of land, which he works as a subsidiary occupation. (Area 6.)

The last type of complex is the great city, a distinct entity in brick and mortar as in its social and economic structure. Most of the cities are intimately bound up in historical development as in their present functions with the lands which surround them, others are out-growths of modern industry. Still others are great historic cities placed in the midst of thinly peopled areas, whose activities they integrate, but which certainly did not call them into being. All such cities perform special services of a national character. The chief of them are Greater Berlin, and the lower Weser and Elbe areas, with their capitals in Bremen and Hamburg. Somewhat similar are Breslau and Munich. (Area 7.)

On the basis of distribution of the industrial population, of the principal industries, and of the historical background of their development, we may recognize several distinct and dominantly industrial regions in pre-war Germany. The distribution of persons engaged in industry is shown in the tables on pp. 231 and 232.

Lower Rhine Region (Rheinland-Westfalen) has its core in the Ruhr coal-field and the Cologne lignite area, together with the heavy industries associated with them. The core is encircled to the south, west and north-west by a zone in which the textile industries and metalware and machinery industries are dominant. This area employs about 2.5 million people in industry or 20 per cent of the Reich total.

The Middle Elbe Region. The present dominantly industrial character of Saxony is based in origin upon its early handicrafts industry. It is characterized by a great variety of highly skilled machine and metal-working industries and the production of textiles. Thuringia is also a seat of skilled and old-established industries such as the making of ironmongery, toys and porcelain. The lowland to the north of Saxony is an area of recent development based entirely on the mining of lignite, salt and copper, the growth of sugar beet and the production of beet sugar. It is essentially a region of new heavy industries. The lignite field of Lower Lusatia is closely related in its industrial character; it has important electricity plants and glass industries. This area employed before the war about 2.5 million people in industry or 20 per cent of the Reich total.

Upper Silesia and the Saar both owe their industry to the mining of

coal. Upper Silesia is now absorbed in its entirety in Poland and the Saar in France. The former produces 60-70 million tons, the latter 10-15 million tons.

Silesia and Württemberg have essentially the same economic structure, in that they are areas of early development of metal and textile handicraft industries, from which the modern factory industries have developed. In Württemberg, in particular, these are carried on in towns and villages and draw a large part of their labour from the surrounding farms and villages. The Silesian industry is located mainly in the Sudetes uplands.

The Middle Rhine Region has its chief foci at the northern end of the Rhine Rift Valley, in Frankfurt-Main, and Mannheim-Ludwigshafen. It is characterized by a great variety of industries which are partly rooted in the early manufacture of leather, boots and shoes; and are partly to be attributed to the advantage of transport facilities for bulky raw materials by the Rhine, that support the chemical industries, and partly to the treatment of local food supplies and other agricultural products. Eight per cent of the industrial workers of the Reich are in this area.

The Great Cities form a separate group. Each of the great cities has a similar industrial structure, possessing a great variety of industries, which draw upon a local skilled labour supply; and serve mainly a contiguous regional market, although markets may in fact be nation-wide, e.g. the cigarette industry of Dresden. *Berlin* is the greatest of them all, for it employed one million persons in industry or 8 per cent of the Reich total. Two-fifths of its employed persons in industry were engaged in the skilled and highly finished steel and metal industries. The electrical apparatus and automobile industries alone consumed a half of the total power consumption. Clothing industries, the building trades, foods, printing and publishing are the other chief industries. *Hamburg* and *Bremen*, specialized ports, owe their functions mainly in their service to their large hinterlands and not to the more or less empty wastes of heath and moorland around them. Each is an isolated and specialized industrial-commercial community.

CHAPTER 9

AGRICULTURE AND AGRICULTURAL REGIONS

LAND USES

THE CHIEF types of land use in Germany as a whole fall into six main categories: arable land (44 per cent of total area, 60 per cent of which is under cereals), permanent meadow and grass (17 per cent of total area), woods and forests, tree and bush crops (27 per cent of total area), uncultivated, but cultivable land, and unproductive land (12 per cent of total area). Comparison with the adjacent countries may be made from the following table. Land uses in Germany are shown on Fig. 31 (pp. 204, 205).

Country	Percentage in Relation to Total Area			
	Arable	Perm. P. and Grass	Woods and Forest	Other Land
Austria	23.5 (58)	27.0	37.5	12.0
Belgium	35.0 (55)	23.0	42.0	42.0
Czechoslovakia ..	42.0 (60)	16.5	32.5	9.0
Denmark	62.0 (50)	10.0	28.0	28.0
France	38.0 (50)	21.0	20.0	21.0
Germany	44.0 (60)	17.0	27.0	12.0
Netherlands	30.0 (57)	39.0	7.0	24.0
Poland	48.0 (63)	17.0	21.0	14.0
Switzerland	12.0 (24)	41.0	22.0	25.0
England and Wales ..	24.0 (46)	57.0	19.0	19.0

Figures in brackets give proportion under cereals to total arable land.

Source: *International Yearbook of Agricultural Statistics*, 1937-8.

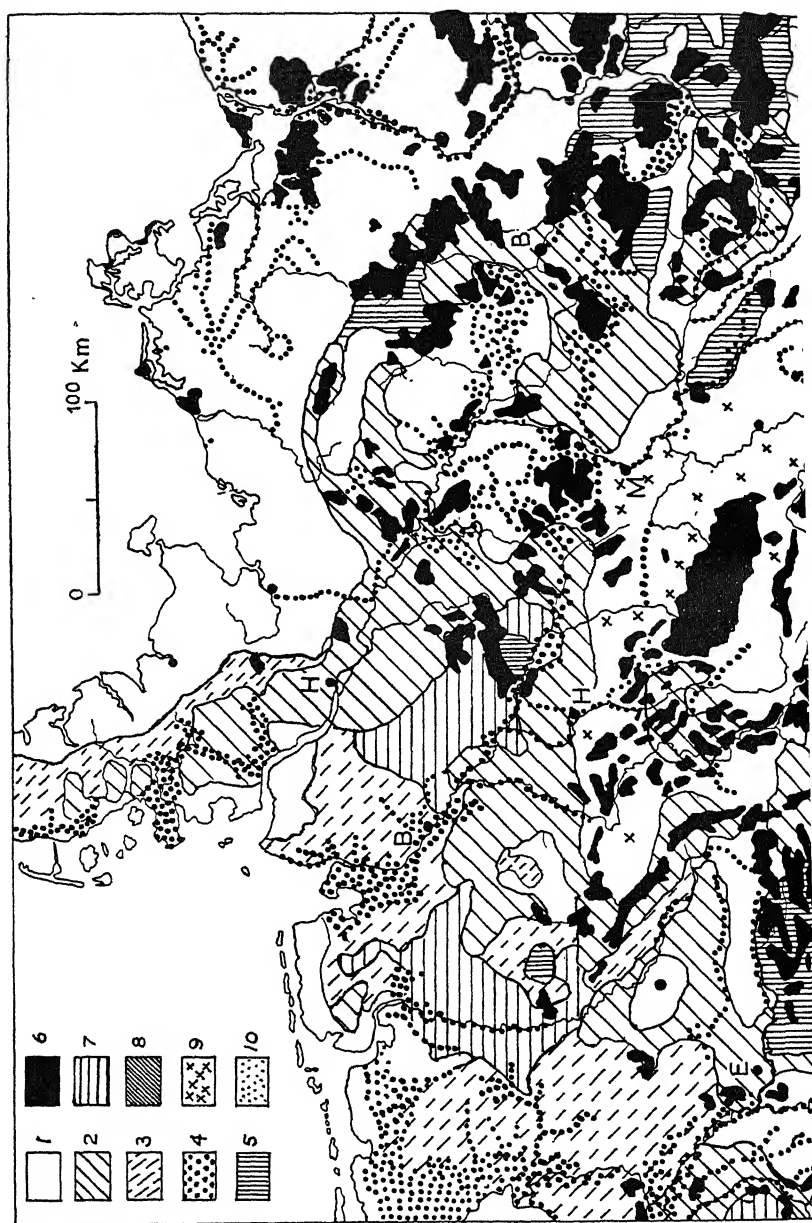
Land use and the natural vegetation cover are not static. They are in constant process of change through the adaptation of changing conditions and technics to the physical and climatic circumstances of the particular local environments. Large areas of Germany have been continuously occupied by man since Neolithic times. A third of southwest Germany falls into this category. Land free of forest and in which open woodland has been cleared has become dominantly arable land. This comes clearly to light in the present distribution of the areas with loess soils. But at the beginning of the Germanic settlement not only such

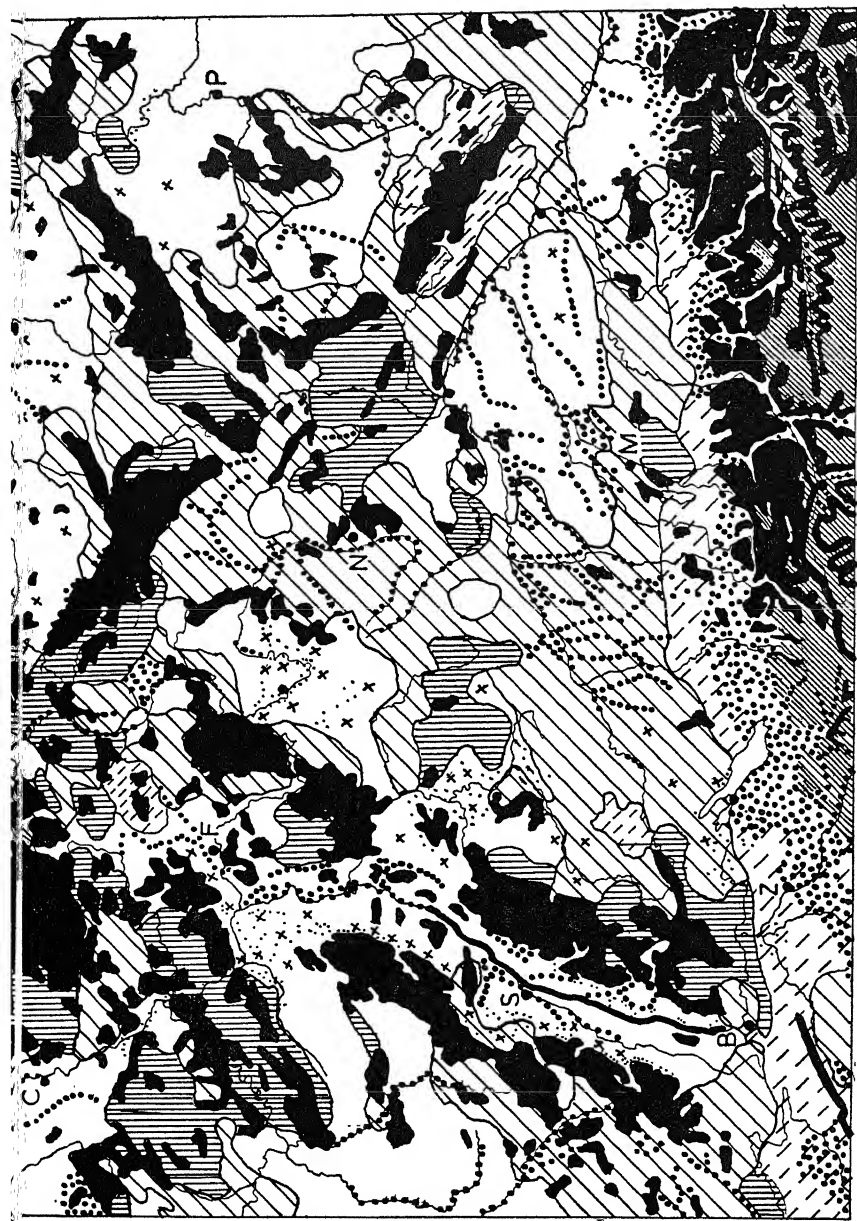
fertile areas were free of forest. The *Muschelkalk* platforms have everywhere become dominantly arable landscapes. In the Kraichgau over 60 per cent of the area is under arable land, and over 70 per cent in the neighbourhood of Würzburg. Other open and early settled lands were the Franconian and Swabian Alb, in which however the lack of surface water prohibited close settlement and where much of the heathland has been recently afforested. The same was true of the gravel plains of the Lech and Isar and much of the Geest of northern Germany. The early settled lands were not on the most fertile soils. In Schleswig, the Geest lands in the centre were the first to be settled, but they were early outstripped by the spread of settlement to the adjacent marsh and morainic lands. Similarly, the Lias plains with their meadows, arable, vineyards, and orchards, replaced the early settled uplands of the Alb. On the other hand, areas of heavy soils, such as the ground morainic uplands of northeastern Germany from Schleswig-Holstein to East Prussia, have been brought under cultivation through forest clearance and today are predominantly arable lands (60 per cent of total area). The valleys in eastern Germany have been reclaimed since the eighteenth century and brought mainly under meadow lands.

River plains, in general, must have been wet and covered with scrub and alder woods (*Auenwald*) and were actually avoided by medieval man, except at bridge points. Roads followed the raised, drier terraces along the valley rather than the floor itself. Reclamation commenced in the Middle Ages, and the soils often proved to be exceptionally fertile. This comes to light in the lower Rhine Plain, in the upper Rhine Plain, in the plains along the Danube. Ground moraines on the Bavarian Plateau have been brought into arable cultivation to the extent of a half of the total area. This is true also of the Lias plains and of the Keuper marl lowlands, and of the red Bunter clays of Hesse and the lower Eichsfeld, none of which were favoured by the initial Germanic settlement and were not cleared until the Middle Ages. Continuous labour was required to keep these lands in cultivation from prehistoric times. We know for instance that at the end of the Bronze Age a moist period set in that was favourable to forest growth even in the loess areas, but these areas, that in parts carried a steppe flora, were kept in cultivation, and the growth of forest prevented even where the climate in the west made this possible.

Forest. It is probable that in the days of Tacitus two-thirds at least of Germany was forested. The great inroads on the forest were effected in the Middle Ages. Today the general proportion is less than one-third. Forests are dominant in areas of rugged relief and on the barren sandstone plateaus of the Central Uplands. They also clothe the steep slopes of the Alps between the cultivated valley bottoms and the high rock-scarred or snow-capped summits and Alpine pastures. In the Northern

FIG. 31—GERMANY: LAND USES (*from A. d. D.L.*) (scale, 1 : 4 m.)





Land use per total area:

1. Over 50% arable
2. 30-50% arable with mixed uses, e.g. 10-30% grass or forest
3. 30-50% grassland, with mixed uses, e.g. 10-30% arable
4. Over 50% grassland, including the river plains
5. 30-50% forest, with mixed uses, e.g. 15-30% arable and/or grass

6. Forest over 50%
7. Over 35% heathland, with mixed uses, e.g. arable and/or grassland
8. High Alpine pastures, rock and ice
9. Orchards and market gardening
10. Vineyards

Lowlands, forests remain on the poor soils of Brandenburg and on the Baltic uplands. On the other hand, areas with smoother plateau relief at intermediate altitudes in the Central Uplands were extensively cleared and settled in the Middle Ages, and the Rhine Plateau, southern Bavaria (between the Danube and the Alps) and the south of the Black Forest, to name but the chief areas, present a variegated panorama of forest, field and meadow.

Since forest covers just over a quarter of the whole area of Germany, we must pay some further attention to its character and uses. Out of 28.5 million acres of forest in 1927, 6.5 million acres were deciduous and 22 million coniferous. About 2.5 million acres were classed as deciduous coppice. Coniferous forests have been extended greatly during the nineteenth century and after by plantations in order to meet the demand for timber and pulp. A quarter of the deciduous coppice is oak, that is stripped periodically for its tannin bark. Deciduous forests, both oak and beech, predominate in the Rhinelands and coniferous in the east and southeast provinces. The distribution of forest is shown in Fig. 31. The areas with little or no forest (shown as mainly arable, grass or heath) broadly correspond with the three loess areas of the *Börde*, the northern end of the upper Rhine Plain, the northwestern heathlands, and the Baltic uplands, especially around the lower Oder. While the most widespread of the deciduous forest trees is the beech, there is a marked concentration of oaks in the middle Rhine lands, a fact that accounts for the localization of the leather-tanning and modern leather industry in this area. Scots pine is dominant east of the Elbe and in Franconia and the spruce in the highlands of the south and centre. (See also Fig. 12, p. 78.)

About a half of the forests are in public ownership. Most of the coppice is privately owned. A third of the forest belongs to the State and a seventh to the communes, and such forests are located mainly in the Rhineland provinces. Until the early nineteenth century there was very little public supervision of forest growth and exploitation. But since then the standard has been enormously increased by State supervision of planting, cutting and general management. The "entailed" forests in private hands have also undergone such improvement and the private and communal woods, though varying in management, are controlled by State regulations with regard to forest cutting, reafforestation. Trained personnel manage all the communal forests. The State forests make up a third of the area under forest but yield nearly a half of the sawn timber. Small private forests and communal forests are mostly coppice (*Niederwald*), and are characteristic of the Rhineland. They are used for miscellaneous purposes—to provide the varied requirements of the farms with fuel, fencing, litter, and pasture. The bulk of the normal annual timber cut in Germany goes for fuel (about 40 per cent), and constructional

timber (about a third), with pit-prop and chemical pulp demanding much smaller quantities (less than a tenth each).

The domestic production of timber does not meet the consumption and about a third of the constructional timber was imported until 1933. After this date there was a great increase in domestic cutting, that reached over four times the annual growth, and this will necessarily reduce the rate of cutting in the post-war years.

Heath, Bog and Barren Land (Ödland). Only twenty-three *Kreise* in northwest Germany have over 20 per cent of their areas under heath, bog and other barren land. The biggest expanses were between the lower Elbe and Weser where figures reached 40-45 per cent. In the Lüneburg Heath the proportion is 24 per cent, but only 4-7 per cent in the Westphalian Lowland (excluding the Senne, which is almost entirely heathland). Small percentages of *Ödland* occur in the highlands of central Germany, in the Eifel, and the Rhön, for example. In southern Germany the proportion reaches 7 per cent in the young morainic areas of Oberbayern and the Allgäu, although here we know that lakes and bog covered a much greater area in the sixteenth century. Reclamation has taken place since then in these areas as well as in the Munich Plain and along the Danube, especially since the eighteenth century. Barren and rugged rocks make up most of the quarter of the total area of the *Bezirke* of Gamisch and Berchtesgaden.

The Geest of the Northern Lowland has not always carried heath. Heather is, in fact, a stunted form of scrub that has succeeded an open woodland of birch and oak, through clearance, burning, and cutting for making compost. During the nineteenth century great areas have been afforested, and farmland has also spread with the use of chemical fertilizers. Thus, whole sections of heath have been transformed. The largest tract of continuous heath covers 36 sq. km. and no point is more than 3 km. from the nearest wood. A similar trend has taken place in Jutland, where the heathland was reduced by a half in the second half of the nineteenth century. This heathland, however, is useless for modern grass farming. Grassland has spread on the low-lying wetter lands, although here sections are under both grassland and arable.

Arable Land. The predominantly arable areas, in which over 70 per cent of the total land area is devoted to arable farming, form two great belts. One extends from the Danish islands to East Prussia in the great areas of ground moraine in the Baltic coastlands. The other, and indeed the main belt, extends throughout Continental Europe from northern France, along the foreland of the Central Uplands from central Belgium to Upper Silesia. From the latter area it forks north and south of the Carpathians to broaden out into the vast belt of Black Earth soils in south Russia; and a second belt extends through Moravia into the Danube

lowland to south Russia. Between these two main belts stretch the Northern Lowlands, which, in their surface and land use, fall into three parts. The northwestern lowlands, with their combination of marsh, moor and heath, are mainly under grass but large areas especially in Germany are still uncultivated wastes (25-30 per cent). The central area of Brandenburg and Lusatia is still largely wooded with arable on its better soils. The third area in central Poland (Posen and Warsaw) is a vast area of arable farming in which forest covers today only some 15 per cent of the total area.

In the Central Uplands the arable lands are found in several scattered areas, notably the upper Rhine Plain, the middle basins of the Main and Neckar, and strips in southern Bavaria of which the largest extends along the Danube below Regensburg.

Grassland. This is combined in greatly varying degree with arable and woodland, since this is the very essence of mixed farming—crop growing and stock farming—which is universal in western and central Europe; but it seldom reaches the complete dominance of the other two. There are two belts in which permanent pasture land dominates land use to the extent of over 50 per cent of the total land area. The first embraces the Northern Lowlands from the lower Rhine to western Denmark and the lower Elbe. Most dominant on the marsh lands, it covers over 30 per cent of much of the German lowlands west of the Weser. The second belt extends throughout the northern Prealps through Switzerland and the Jura, and along the northern Prealps in Bavaria and Austria. The Swiss Plateau (between the Alps and the Jura)—the chief farming area of Switzerland—and southern Bavaria west of the river Lech have 30-50 per cent of their area under grass. To these areas must be added the higher lands in the Central Uplands.

Grassland, while dominant in these areas, occurs with varying proportions, in combination with arable land. In general, it has a higher proportion in the cooler and more humid lands in the west, and is insignificant in the drier and warmer lands to the east of the Elbe and the eastern end of the Alps (about longitude 16° East).

While the dominantly arable areas prefer the dry and summer-warm areas, grasslands prefer the cooler and moister climates. In summer-dry areas the damp valley floors are under grass. This is conspicuously the case in Brandenburg. The main areas of grassland, however, lie in the damper areas. But even the coastal marshes are not always dominantly under grass. The Ditmarsch is under arable and this is also true of the strip of marsh between the Ems and the Weser. The more recently reclaimed salt marsh is especially well suited for wheat. In the Central Uplands the areas of higher altitude are devoted mainly to grass, where they are not wooded, as in the Thüringerwald. Orchards have been

introduced into the grassland economy of the Bergisches Land in the last hundred years. In the district around Aachen, as in Verviers west of the frontier, arable land has steadily decreased before grass so as to result in a *Butterland* economy. Large stretches of the Rhine Massif have been afforested in place of heath, and large stretches of high bog are only found across the frontier in the Hohes Venn. In rainshadow areas, there is a marked increase of arable land, as in the Pellenz, Maifeld and Ahrtal.

Stony rough pastures on the heights and strips of richer meadows in the valleys characterize the high Westerwald, where the settlements are sheltered by tree fences. In most of the higher uplands, however, as in the Bohemian Forest, Black Forest, and Vogtland, arable and grass land are intermixed and alternate in rotation (*Feldgraswirtschaft*) in an ever-changing panorama, and settlements reach upwards as far as the limit of cultivated land. There is no temporary settlement of shepherds in high summer pastures as in the *hautes chaumes* of the Vosges. Only the highest parts of the Black Forest, Vosges and Sudetes have pastures above the forest line. Whereas in the Vosges and the Black Forest these high pastures are temporarily occupied by shepherds' huts, in other areas, such as the Rhön, hay is carried from the high pasture down to the villages, without any transference of the cattle to the pasture itself. Between the pastures and the village, however, there are often intermediate settlements in which young stock are reared. Large areas of the Central Uplands are under *Feldgraswirtschaft*, in which meadow and crop are constantly rotated from year to year. The practice of burning the bush for temporary cultivation (*Haubergwirtschaft*) is still carried on in parts, although such areas are recorded as woodland. The Siegerland is one of the areas of its survival.

Grassland is ever on the increase in the morainic lands of the Bavarian Plateau. It becomes dominant in a strip right along the foot of the Prealps and in the Prealps themselves. Thus, especially on the Flysch sandstones to the east in Austria, grassland is dominant, but it is far less significant on the limestone Prealps.

The Allgäu must be singled out for special reference. The rainy climate and the cool summers coupled with the predominance of heavy clay soils have favoured the development of pastoralism. Three-quarters of the whole area is under grassland. This one-sidedness is due to the spread of a monoculture that has developed in Switzerland over the last 150 years, and spread to the Allgäu in the last fifty years. It involves concentration of grass to the exclusion of all other subsistence crops. Fields under crops are quite negligible, and it is only on the hill-tops and in valley gorges that woodland remains. Even on the northern shores of Lake Constance, where field, vineyard and orchard are intermingled, both arable land and vineyards have somewhat decreased before the

spread of permanent pasture. These changes are most marked on the Swiss side, where the men do the farm work and the women are employed in the making of textiles, the predominant industry of the area around St. Gallen.

Crops. Rye is particularly suited to the cooler growing seasons and poor soils of the Northern Lowlands and of the Central Uplands. Between the lower Ems and the lower Weser, in much of Brandenburg and Posen, some three-quarters of the grain land is sown with winter rye. It is least important in Thuringia and Württemberg, its place being taken here by spelt. In the higher altitudes and in the eastern provinces the thick snow-cover necessitates the sowing of grain in spring, and this is the dominant grain in all the higher lands of the Central Uplands.

Wheat makes more exacting demands on both soil and climate and is the main grain in the lower lands of south Germany and in the Börde, whereas in the Northern Lowland it is only grown on the marsh soils of the Elbe and Vistula. It is also the main grain in the Rhine lowlands. Spelt is a variant of wheat that is peculiar to Swabia, where it covers two-fifths of the grain land. Winter-sown barley has much the same distribution as wheat. Summer-sown barley prefers the dry, sunny Continental climate in south Germany, Thuringia, Saxony and east Holstein. Oats are dominant in the cool, damp northwest on the North Sea coastlands and in the mountains. Germany is the biggest producer of oats in Europe. The potato is grown widely as a foodstuff. The greatest areas of production are in the eastern tier of provinces east of Berlin, in the middle Elbe basin north of a line from Erfurt to Dresden, and the upper Rhine lands, with its main nucleus at the northern end of the Rift valley. But the highest proportion of potatoes to grain is attained in the Rhenish uplands—in the Odenwald (50–60 per cent) and the Siegerland (80 per cent). Sugar beet, on the other hand, has a very localized production. Saxony and Hanover Börde are the chief areas, with secondary areas on the loess soils of central Silesia (immediately west of Breslau) and the Cologne lowland (immediately west of Cologne). Secondary areas of production are Mecklenburg and the northern end of the upper Rhine plain.

Of these various crops, rye covers by far the greatest area (4.2 million hectares) with oats as a close second (2.8 million hectares). Potatoes cover 2.8 and wheat 2.1 million hectares. Meadows cover 8.4 and arable 19.1 million hectares. The rye harvest is a quarter of the world's total. Rye and oats are normally exported. Barley and potatoes are absorbed entirely by the home market, but wheat and maize production cannot meet the home demand and there are normally considerable imports of these two grains. Sugar beet meets the home demand for beet sugar as well as supporting an export trade. Orchards and vineyards also meet the national needs.

Livestock. These are widespread owing to the general distribution of meadow and the growth of fodder crops and the universal practice of a mixed farming economy. In 1939 there were 3.0 million horses, 20.5 million cattle, 25 million pigs, 4.8 million sheep and 2.3 million goats. But production no longer meets consumption. Cattle are normally stall fed, except for the Alpine areas, where they go to open pastures in summer, and in the northern marshes, where they are kept on the meadow throughout the year. The main concentrations of cattle are found in the North Sea coastlands and Schleswig-Holstein, and in Württemberg and the Bavarian Plateau. Pig-raising is more important in Germany than in any other land and the greatest area of concentration is in the north-west, inside a curved line from Hamburg to the Ruhr. The remarkable decrease in the numbers of sheep in the last hundred years is paralleled by the development of rural economies in other west European countries. The main areas of concentration (with over 32 per 100 hectares) are in the middle Elbe Börde, Mecklenburg and western Pomerania, and Württemberg.

TYPES OF RURAL ECONOMY

Rural economy depends upon certain basic conditions which may be briefly summarized. The size of the farm holding and the disposition of the fields determine in considerable measure the character of farm organization and production. The large estate permits mechanization and the employment of hired labour on a commercial scale; in areas where it is dominant there is normally a large surplus of crops or stock for sale. The small-holding is usually a family concern, and little of its production leaves the farm. When its productive capacity is low, the peasant has to supplement his livelihood by a domestic craft, by working in a workshop or as a farm labourer. The family do all the farm work except for help at harvest time; the cows provide the milk and draw the plough. The adequacy of a holding to support a family clearly depends, however, upon its productive capacity; a small farm on good land may keep a family in relative comfort; on less productive land, it would be quite inadequate. Climate and soil are the two chief physical determinants of the range of potential crops and their possible yields.

The soils fall into several main types judged according to their value (Fig. 32). The fine-textured, friable loams developed on the loessic deposits are among the most fertile soils of Europe and are especially suited to arable cultivation. There are large areas of infertile soils in the Northern Lowlands, which support only unexact crops like rye, potatoes and oats. Equally poor soils are to be found in the highland areas as on the sandstone plateaus of central Germany, and the granitic soils of southern Bohemia, as well as the rocky or damp heavy clay soils of high altitudes.

All these poor soils cover a good sixth of the agricultural area of Germany. The remaining soils range from heavy clays to loamy sands; the most productive of these are on the rolling surfaces of the Baltic uplands and the rich alluvial soils of the North Sea marshes and polders.

Climate is the second determinant. The upper limit of wheat cultivation is about one thousand feet in central Europe, and of rye about two

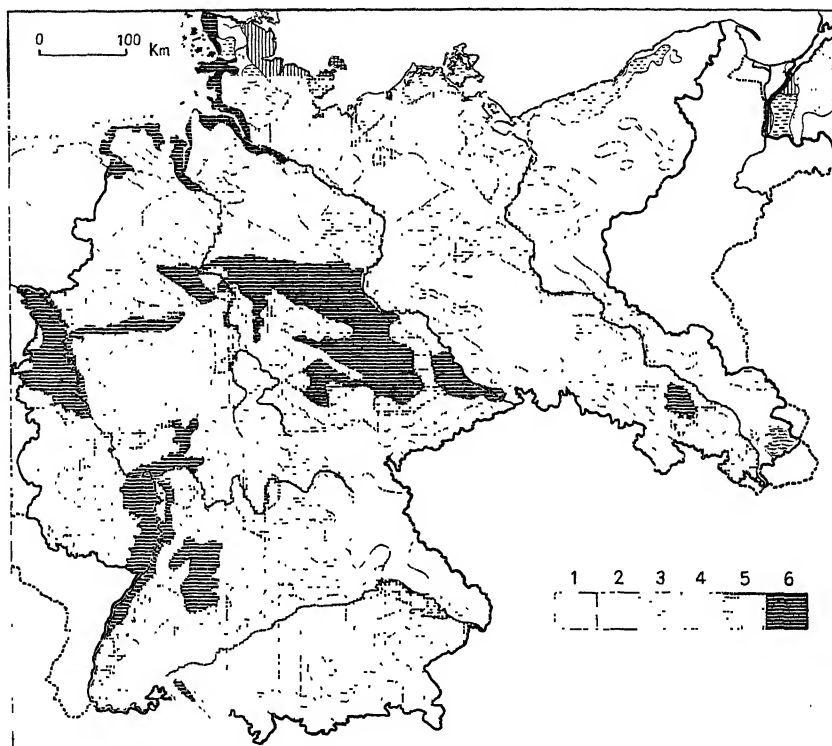


FIG. 32—GERMANY: ASSESSED VALUE OF LAND VALUE IN REICHSMARKS (pre-war) OF EACH HECTARE OF FARMED LAND (from Niehaus) (scale, 1 : 10 m.)

1. under 500. 2. 500-700. 3. 700-1000. 4. 1000-1400. 5. 1400-1800. 6. over 1800.

thousand feet. Particularly important are temperature and rainfall conditions in the chief growing season from May to July. The low-lying sheltered lands of the southwest of Germany and Switzerland have an early spring and a long, warm, dry summer; here thrive the vine, tobacco, hops and maize. The Northern Lowlands beyond the Elbe and in the Danube lowlands also have a small rainfall and a long dry summer, while its winters are severe. Here meadow does not flourish, except on the valley bottoms, and among the cultivated grasses the place of the

moisture-loving clovers is taken by the drought-resistant lucerne. This is an area of arable farming, with rye on the poorer soils and wheat on the better soils to the south. The drought-resistant spring-sown barley is also widely cultivated. Spring is everywhere the dry season but rain falls generally in summer, especially in the northern coastlands and in the Southern Uplands and mountains. Such conditions are unsuited to grain cultivation. Permanent pasture, clovers and oats dominate the land utilization.

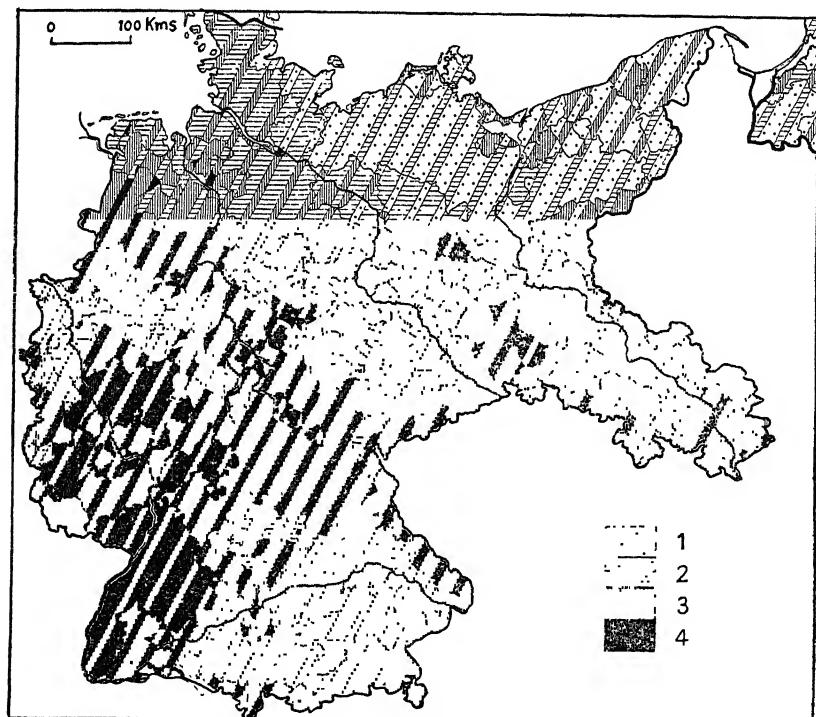


FIG. 33—GERMANY: SIZE OF FARM HOLDINGS (pre-war) (from Niehaus (scale, 1 : 10 m.)

1. Over 250 acres. 2. 50-250 acres. 3. 12.5-50 acres. 4. Under 12.5 acres.

Holdings of under five hectares (one hectare equals 2.5 acres) take up 11.5 per cent of the farm area, and they are dominant throughout west Germany (Fig. 33). On the other hand, the large holdings and estates over 100 hectares take up 20 per cent of the farm area, and are dominant in eastern Germany, east of the Elbe and the upper Oder. The Junker or large landowner on these great estates depended upon the hired labour of a rural proletariat. With a high birth rate among its rural folk, a lack of non-rural occupations and the spread of large-scale mechanized

farming methods, this area has been a main reservoir for the growing urban centres. The small-holding of less than five hectares is normally not adequate to meet all the requirements of the farmer and his family and he usually has another string to his bow, working for a wealthier peasant, engaging in a handicraft on his own account, or as a worker in a factory. The intermediate type, the farmer peasant, depends for his livelihood upon the produce of his farm, which he works with the aid of his family and some outside labour at harvest time.

Farm Holdings in 1939 (Statistisches Handbuch von Deutschland).

Total Number: 9,532,907

Farm Area: 43,165,882 hectares

<i>Holdings (hectares)</i>	<i>No.</i>	<i>Area hectares</i>
<0.5 ..	6,334,000	645,000
0.5-2.0 ..	959,000	1,022,000
2.0-5.0 ..	762,000	2,529,000
5.0-20.0 ..	1,105,000	11,263,000
20.0-50.0 ..	281,000	8,382,000
50.0-100.0 ..	55,000	3,681,000
100.0-200.0 ..	17,000	2,306,000
Over 200.0 ..	17,000	13,335,000
TOTAL ..	9,530,000	43,163,000

It will be noted that there is a great majority of small-holdings, farms of less than $2\frac{1}{2}$ acres making just short of a half of the total. Farms of less than 25 acres make up nearly nine-tenths of the total. Almost 90 per cent of the agricultural land was tilled by the owners and about 12 per cent by tenants or hired labourers. About 40 per cent of all the farmers cultivated their own land only; 30 per cent cultivated rented land in addition to their own, and the remaining 30 per cent cultivated rented land. There has been virtually no change in this division of land ownership in the last fifty years.

The general trend in the last fifty years has been for the large estates to be reduced in number and subdivided in smaller holdings, while the greatest numerical increase is recorded in the dwarf holdings. The peasant farms show least change. They form the stable agricultural backbone of the country and it was to preserve this peasant class that the Hitler Government introduced the Hereditary Farms Law (*Reichserbhofgesetz*) in 1933. This law applied to all farms which were big enough to support a family and did not exceed 125 hectares. All such farms were entailed and their owners deprived of the power of alienating or mort-

gaging their land. Steps were also taken to consolidate the dwarf holdings so as to make holdings sufficiently large to support a family. The Reich Settlement Law of 1919 was designed to take over large eastern estates and divide them. By 1932 160,000 acres were disposed of in this way and the Hitler Government purchased over 1 million acres for this purpose. In 1938 all entails were abolished on property except the peasant farms under the Hereditary Farms Law as from January 1939. This brought many estates into the hands of the Government and made them available for peasant settlement.

A Soviet law of 1945 aimed at the elimination of the large estate in eastern Germany with over 100 hectares. A total area of 3 million hectares has been subdivided into holdings of 7-9 hectares. Two million persons were affected by these changes, receiving among them 2 million hectares, the rest being used as public property. These people included small peasants and refugees from the east. Through these measures, the proportion of holdings of 5-20 hectares increased from 36.7 to 69 in Mecklenburg, 34 to 48.3 in Brandenburg, and 49 in the zone as a whole. In the Western Zones, though a similar law was passed, it did not have such remarkable results, since here there are few large estates. Western German lands are in the hands of small-holdings, and here the main agrarian problem is to consolidate holdings that are too small for the support of their owners.

We have already examined on p. 128 the main types of husbandry in the early nineteenth century. The three-field system was modified by individual farmers by introducing a crop such as potatoes, beet, roots or grasses in place of the fallow in every third year. This results today in a dominantly arable type of farming in which about two-thirds of the area is in arable, all other crops taking up about one-third of the land. The peasant follows, in effect, a three-year rotation. The main grains are wheat (winter-sown) and barley (summer-sown). The other crops include root crops in combination with sugar beet and beet root on good soils, and potatoes and turnips on poor soils. With these there also occur in such three-course rotations special crops, often referred to as industrial crops, such as hops, tobacco, flax, hemp. Thus, this intensive three-year rotation system consists of wheat, root crops (mainly sugar beet), barley on good soils; and rye, roots (potatoes) and oats on the poorer sandy soils. This modified three-year rotation occurs over a wide area of Germany, in those areas that were early settled and contain the compact village, in which the three-field system of land-holdings was long practised. The simple three-course, with land in fallow from harvest to the following June, when the first ploughing takes place (*Schwarze Brache*), is still found in considerable areas in South Germany.

This type merges into other kinds of rotations. The Norfolk four-

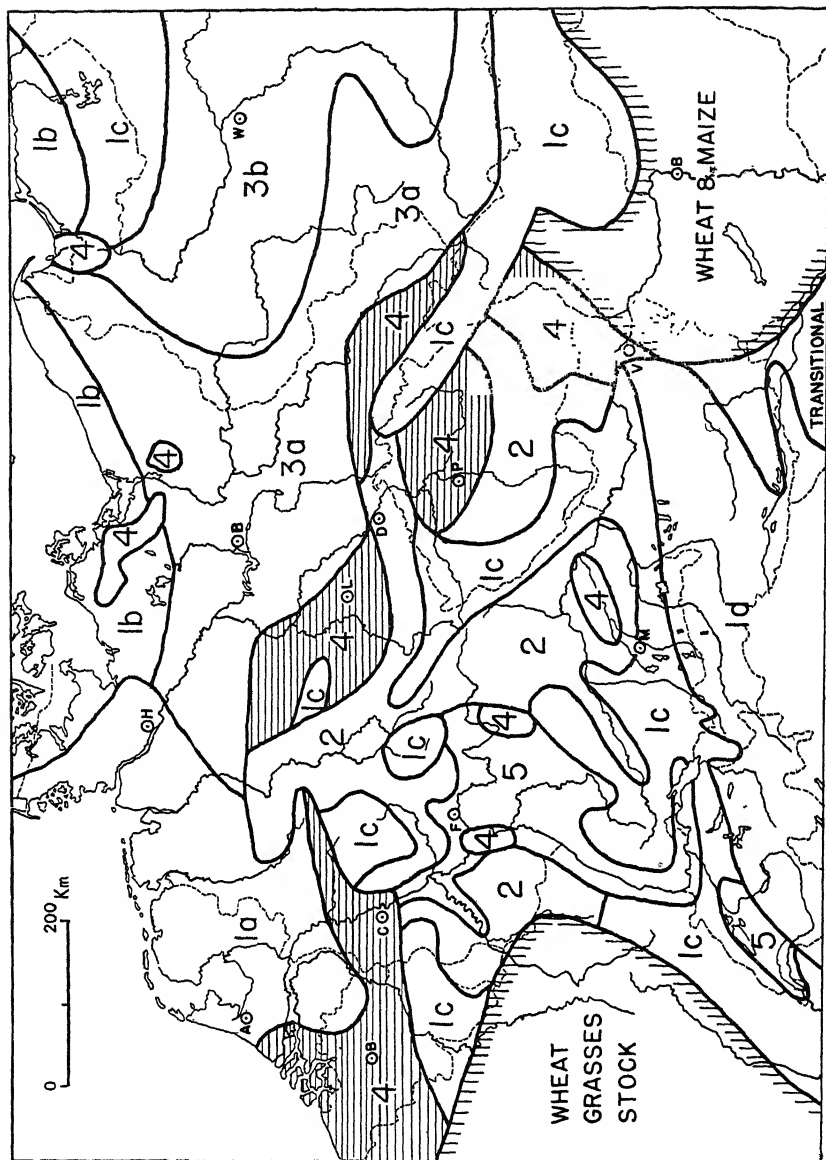


FIG. 34—CENTRAL EUROPE: AGRICULTURAL REGIONS (based on Niehaus) (scale, 1 : 10 m.)

Humid and Cool Regions

- 1a. Lowlands—dairying and beef production: pastures, hay, rye and oats, forage crops: Northwestern Lowlands.
- 1b. Rolling land—ditto: Baltic Uplands.
- 1c. Foothills and low mountains—dairying, pasture, forest.
- 1d. High Alps.

Drier and Warmer Regions

2. Hilly country—grain (rye, oats), potatoes, livestock.
- 3a. Plains and rolling land—rye, potatoes, livestock, with forest and marsh dominant.
- 3b. Ditto, with arable land dominant (over 70% of total area), with wheat and barley as subsidiary crops to rye.

[Continued at foot of next page]

course system includes roots, oats, either red clover or legumes, and wheat. Rye and oats are grown on the light sandy soils and wheat and barley on the good loams and clays; the cereal crops make up about 60 per cent of the total. In the rotation of the Baltic lands and in the northern marshlands there occurs a long rotation with several years under grasses. This system was introduced in the early eighteenth century on the large estates. In the drier areas, in the Danish islands, Mecklenburg and Vorpommern, grains and roots are more important.

AGRICULTURAL REGIONS

Let us now turn to the character and extent of the chief areas in which the same kind of rural economy predominates (Fig. 34 and Appendix).

Mixed farming everywhere predominates, and no farms depend exclusively on grain production. Even the largest farms of the dominant grain-growing lands draw at least a third to a half of their income from the sale of animal products, while those depending on the sale of live-stock products only carry an intensive arable cultivation on about a third of their land. For the Reich as a whole two-thirds of the agricultural production is derived from animals and animal products, and one-third from crops. It is according to the proportions of crops and animal production that the following classification of the agricultural regions has been based.

As a first general subdivision we may recognize those areas in which more than 60 per cent of the farm income is derived from livestock and those in which 40 per cent and more of the income is derived from crops. The first are mainly located in humid and cool regions, and the second in drier and warmer regions.

The chief livestock farming areas coincide with the grassland belts in the Northern Lowlands and the southern highlands and the Alps. The first stretches from the Dutch frontier to East Prussia, and in fact finds its continuation in northern Holland and western Denmark. It falls into two sections in Germany, the Northwestern Lowlands and the Baltic provinces.

The Northwestern Lowlands include the polderlands (German, *marschen*), the low peat bogs (German, *moore*), and the higher and drier sandy heathlands (German, *geest*). The polderlands, consisting of flat, moist alluvial clays and loams, do not have a single type of farm economy. In some parts, meadows dominate; in others, arable farming—although oats

4. (Horizontal lines) Plains and rolling land—wheat, barley, sugar beet and livestock, with industrial crops (e.g. flax in Belgium).

5. River valleys and hill lands—wine, fruits and grain.

The area in the N.W. of Yugoslavia is marked as transitional. Consult the map by Niehaus in the *A. d. D.L.* on which this is based.

are often in excess of the bread grains. The dominance of arable farming is especially characteristic of the Dutch provinces of Holland, Zeeland and the lower Rhine district of the Betuwe. But everywhere the economy is centred upon livestock production and pastures generally dominate the land use. Cattle, bought lean in the spring, are fattened on the meadows. Beef cattle and horses are also bred, and dairy farming is especially important near the great cities. Farm holdings from 50 to 250 acres are the most numerous.

Adjoining the polderlands are the low waterlogged peat moors and the higher, drier, sandy heathlands, which are traversed by wide river flats with rich natural meadows. Large parts of the moors and heath have been brought under cultivation in the last two centuries, though uncultivated tracts still cover as much as a third of the area of some districts. The poverty-stricken condition of these poor lands has been greatly improved by crop rotation and the application of chemical fertilizers and the import of large quantities of cattle feedstuffs, so that the small peasant is able to sell large quantities of fattened stock, notably pigs. The natural meadows make possible both a cattle-breeding and dairying industry. Most farms have half of their area under meadow and pasture. The main crops on the arable land are rye, oats and potatoes. Pig-breeding and fattening have grown in importance with the dairying industry and with the use of rye and potatoes as feedstuffs. The majority of the holdings on the Geest have under 50 acres. Finally, all these areas normally import large quantities of foreign feedstuffs, notably barley and corn, through Bremen and Hamburg.

Eastern Schleswig-Holstein, Mecklenburg, Pomerania and East Prussia specialize in stock production, although both the country and the economy are very different from the Northwestern Lowlands. This is a rolling countryside of ground moraines, with productive loam soils, like those of East Anglia. Forests have been cleared. Arable farming dominates. Moreover, its climate is cool and moist, although experiencing more severe winters than along the North Sea coastlands. Lastly, it is an area of large farms—especially in Mecklenburg where 60 per cent of the area is in holdings of over 250 acres, and nearly a quarter in holdings that exceed 2,500 acres. Many estates, however, have been broken up since 1945. The old strip system of farming has been displaced by compact hedged fields as in southern Sweden, Denmark and Britain. On the arable land, rye usually exceeds wheat, the latter being more important only in eastern Holstein, and potatoes are grown in combination with rye. But the most distinctive feature is the high proportion of cultivated grasses, notably the clovers and oats. This arable production turns upon stock production. An elaborate and long rotation of crops is practised within hedged fields, that was introduced during the eighteenth century.

It is a region of dairying and beef and pig production, and it will be remembered that the Holstein farmers gave the chief impetus to the development of dairying in Denmark. Little fluid milk is marketed owing to the considerable distance from the large urban markets, but large quantities of butter and cheese are exported.

The high plateaus of central Germany and the Prealps have a very heavy rainfall and are largely forested. Patches of cultivated land on stony fields are devoted to the hardiest and quickest-growing crops—oats, rye and potatoes—which are used for both human consumption and animal feedstuffs. The valleys contain rich irrigated meadow lands and the higher slopes rough pastures in or above the forests, these features being especially characteristic of the Black Forest and the Vosges. The cattle of these areas yield less milk than those of the northern regions (1,500 to 2,000 litres per cow per annum as opposed to over 3,000 in the polders), but contain more butter-fat. Much butter and cheese is produced for distant markets. In the Bavarian Plateau (Bavaria south of the Danube), with its stretches of fertile land interspersed with marsh, forest and wide river meadows, wheat and barley cover considerable areas and are even sold as cash crops. Throughout these areas farms are small, averaging $12\frac{1}{2}$ to 50 acres. In the Black Forest a particularly large part (two-fifths) of the ploughed land is devoted to potatoes.

We now turn to the areas which draw the bulk of their income from crop sales. In these areas the land is mainly arable cultivation.

Throughout central Germany there stretches a great triangular area with its apex in the Lower Weser uplands, its base approximately on the Danube and flanked by sheltering highlands to east and west.

It consists mainly of the Weser and Leine uplands in the province of Hesse in the north, and the upper basins of the Maine and Neckar, Upper and Middle Franconia to the south. It consists of hilly lands alternating with lower lands and valleys. From the latter, which are drier and warmer, there is a gradual transition to the surrounding highlands with their pastoral economy. The upper limit of wheat cultivation is about 1,000 feet, of rye about 2,000 feet. In these higher lands and everywhere on sandy soils, rye, oats and potatoes are the chief crops and, on balance, livestock sales exceed those of crops. The basins and valleys are fertile and sheltered, and produce crops of wheat, summer barley (especially for malting, round Nuremberg), and spelt, and even beets and orchards. Arable amounts to two-thirds of the cultivated area, meadow land one-fourth to one-third. The whole of this zone is one of small holdings with scattered strips, and subdivision has been greatly aggravated by the custom of divided inheritance. Holdings between $12\frac{1}{2}$ and 50 acres are the most widely distributed. The three-course rotation is retained over wide areas. The peasant and his family helpers do all the farm work; a

meagre living is wrung from the poor land and little is sold. Of horses there are few, and the cow is at once a milk, draught and (ultimately) meat animal. Frequently the farm does not support its workers and supplementary employment has to be sought in workshop, a factory, or on a farm during the snow-bound winter months, or by emigration to the city.

The lower lands and valleys of southwest Germany form a very distinctive agricultural region. The Rhine lowland and its flanking valleys enjoy a small rainfall and a long, warm summer. This is the zone of vines and orchards, tobacco and hops. These are the chief cash crops of tiny holdings with scattered strips, in which appear, in bright mosaic, small strips of wheat, maize and potatoes, from which, and their cows, the peasants obtain their food. The same type of farming is found in the Rhine above Basel and round Lake Constance in northeast Switzerland. The smooth plateaus of the middle Main and Neckar basins, with their warm limestone soils, are good grain-growing country, and stand in marked contrast to the valleys, in which vineyards and orchards are concentrated in minute holdings.

Arable farming is dominant on the *Gäue* and *Filder*. On the slopes of the *Berge*—the Keuper sandstone hills—and in the dissected scarp zone of the Alb, there are hop-fields, orchards and market gardening, while downstream from Rottenburg on the Neckar the vine flourishes on sunny terraced slopes. Only on the Keuper sands and marls is forest dominant. The *Gäue* uplands are often dry and bare and carry heather, that was formerly used for pasturing sheep in association with the arable farming of the *Gewannsdörfer*. To this day, the villages are compact and sited in hollows while the strips fields around them are still cultivated on a three-course rotation that derives from the old three-field system of communal rotation. The *Gäue* of Franconia, north of the west-east Keuper sandstone hills from Heilbronn to Hall, are more extensive than in the Neckar basin and carry distinctive names such as the Hohenlohe Ebene, the Bauland, and the Grabfeld. They are distinct from the valleys, that are sunken some hundred metres in the plateau and have strips of meadow land on their floors, and vineyards and orchards on their slopes. Here holdings are minute and the hoe is the typical work implement, rather than the plough that is used on the arable lands of the plateau. These valley tracts bear the name *Grunde*.

The productivity of the loess-covered platforms of the Upper Rhine Plain is reflected in the density of its compact villages. They are spaced at intervals of only 3.5 km. along the Bergstrasse and 3 to 2.5 km. on the edge of the Rhine-Hesse upland. On the sandy soils of the lower terrace, however, where a good deal of the land is still under forest, the villages are spaced at an average distance of 7 km. apart. Small-holdings and horticultural methods and vine cultivation with intercalated crops are

general. The village has a semi-urban function and aspect, especially in the foothill zone, where most of the vineyards are concentrated. Large barns are absent and the multi-storied houses have cellars for wine-making and storage, with outside staircases to the living-quarters above. Compact villages made up of such houses, with narrow winding streets, and frequently with no market place, have over 1,000 inhabitants.

East of the lower Elbe sandy soils dominate with scattered patches of loam, and much of the area is covered with forest and strewn with lake and marsh. The winters are long and cold and the summers warm and dry. Apart from the marshy valley bottoms, the sands and drought are not suited to permanent grass and arable farming is more important than cattle-raising. Rye and potatoes are the chief crops, with oats third in importance as a feedstuff. The potatoes are used for pig-fattening, especially on the smaller holdings in more isolated areas as in the extreme northeast. This is a region, however, of large farms and estates, and here the potatoes are made into alcohol on the farm or into starch and potato-meal in the country towns. This belt is continued eastwards in the great arable lands of central Poland where the same crops obtain, but the land is richer and practically entirely cleared of its forest cover.

Especially marked in Brandenburg is the contrast between the raised remnants of the diluvial platforms and the intervening low-lying, ill-drained plains. The former have smooth surfaces and loam soils and are normally under arable cultivation with compact villages. The plains, on the other hand, were waterlogged and wooded throughout the Middle Ages and were not effectively brought into agricultural use until the later centuries. These are today meadowlands, although large stretches are still covered with bog and forest. The arrangement of such separate compartments, each bounded by small scarplets overlooking the plains, is especially characteristic of central Brandenburg around Berlin.

Between the Northern Lowlands and the Central Uplands there is a foreland zone, characterized by treeless plains, with clustered villages and hedgeless fields. This is the tillage zone *par excellence* of Europe, developed upon fertile loams which are mainly developed from underlying loessic materials. The zone extends from the Cologne Bay to Silesia. It includes, from west to east, the Cologne Bay, the narrow strip of the Haarstrang, the lower Saxony *Börde* from the northern edge of the Weser uplands to Magdeburg, the north foreland of the Harz, the Saxon lowland, and Upper Lusatia. To the west it is continued in central Belgium and the grain lands of northern France. To the east from Silesia the belt is continued in two branches to the north and south of the Carpathians. The first branch includes Galicia and opens out to the Ukraine, and the second passes through Moravia to the plains of the middle and lower Danube, while both branches merge in the great

expanse of the so-called Black Earth Belt of southern Russia. This whole belt contains the chief arable grain lands of Europe. Village after village over hundreds of miles has at least seven-tenths of its total lands under the plough. Moreover, the bulk of the settlement is concentrated in villages around which the three-field system of communal cultivation was developed in the Middle Ages and still determines the pattern of the fields, except where these have been consolidated in recent years.

The climate east of the Harz mountains is continental, whereas to the west it is more equable, milder and moister. This accounts for the difference in colour of the soils that have been developed from the common basic material loess deposits. East of the Harz, these parent materials yield black soils or *chernozems*, that were developed under steppe conditions. To the west, the humus and some of the more soluble constituents have been washed away, so that the soil is yellow-brown in colour but still high in plant foods and easily arable. In eastern Germany the farms are large, averaging over 250 acres, while in the west they are smaller, under 250 acres. In the east, the dominant crops are wheat, barley (especially for malting), and sugar beets, the last often being the pivot of the whole rotation. Fodder grasses include lucerne, which is more suited to the climate than the moisture-loving clovers. In west Germany, oats and rye take the place of beets, but on the large farms of central Belgium and in Picardy the sugar beet is again a main product of that type of large-scale farming which the Frenchman knows as *la grand culture*. Stock are kept in stalls and fattened on the tops of the beet and the waste which is returned to the farmer when the beets have been crushed in a near-by factory. Dairying is particularly important near the great cities, and the great masses of urban population lie in the heart of or near to this extensive agricultural belt. In Germany, the two chief areas are the middle Elbe basin, and Silesia, west of the Oder. The farms are large (over 250 acres), and farming is pursued on a commercial scale. Mechanization coupled with a large hired labour supply, which is especially needed for field work in the cultivation of the beet, and scientific cultivation, result in very high yields. These are among the highest assessed lands in Germany and produce as much as forty to fifty bushels of wheat per acre

APPENDIX. LAND USE BY GEOGRAPHIC UNITS
(After N. Krebs,¹ on the basis of statistics by *Kreise*.)

DOMINANTLY ARABLE LANDS

	<i>Arable</i>	<i>Gardens and Vineyards</i>	<i>Cultivated Grass</i>	<i>Rough Grass</i>	<i>Woodland</i>
<i>I. North German Morainic Lands</i>					
East Schleswig-Holstein Upland ² ..	60	I	9	12	7
Mecklenburg Lowland	56	I	9	8	17
Vor-Pommern Lowland	60	I	12	6	15
Altmark	52	I	10	7	25
Middle Mark Lowland (<i>Platte</i>) ..	55	I	5	I	30
<i>II. Loess Lowlands</i>					
Cologne Lowland (<i>Bucht</i>)	59	3	5	3	14
Soest and Warburg <i>Börde</i>	55	2	4	10	21
Lower Saxon <i>Börde</i> (<i>Gebirgsvorland</i>)	60	2	8	3	18
Harz Foreland (North and East) ..	80	2	4	I	5
Saxon Lowland (<i>Bucht</i>)	69	2	7	I	11
Thuringian Lowland	67	I	4	I	18
Upper Lusatia	52	2	15	2	21
<i>III. Fertile Lands of the Central Uplands</i>					
Westphalian Upland	50	2	7	5	26
Leine Trough and Lower Eichsfeld	53	I	7	4	26
Maifeld	55	I	6	2	27
Limburg Lowland	56	I	9	I	27
Kassel Lowland	46	I	9	3	35
Wetterau	52	2	12	I	27
<i>IV. South German Lands</i>					
Rheingau ³	36	7	6	—	41
Rhein-Hesse Upland	70	22	2	—	4
Vorder Pfalz ³	40	9	7	—	35
Pfälzer Bergland (Saar-Nahe Up- lands) and Westrich (Haardt) ..	54	I	12	I	26
Vosges Foothills	24	13	12	4	42
Baden Plain ³	38	3	14	I	35
Kraichgau-Bauland	53	2	9	I	28

¹ "Die Verteilung der Kulturen in Deutschland," *Festschrift zur Hundertjahrfeier des Vereins für Geographie und Statistik zu Frankfurt-am-Main*, 1937.

² *Kreise* Apenrade, Hadersleben and Sonderburg.

³ *Kreise* include some forested uplands.

Dominantly Arable Lands—*contd.*

	<i>Arable</i>	<i>Gardens and Vineyards</i>	<i>Cultivated Grass</i>	<i>Rough Grass</i>	<i>Woodland</i>
<i>IV. South German Lands—contd.</i>					
Franconian Platform (<i>Platte</i>) ..	57	2	8	2	26
Hohenloher Plain (<i>Ebene</i>)	46	2	21	3	24
Unteres Gäu of Swabia (Neckar Lowland)	53	9	13	1	19
Oberes Gäu of Swabia (Neckar Lowland)	38	5	19	2	30
Ries	52	2	19	3	20
Dungau	58	1	18	1	18
Upper Danube Plains	46	1	19	3	25
Lower Bavarian Upland (Tertiary Hills)	51	1	19	1	23
Bavarian Old Morainic Upland ..	48	1	26	1	18

DOMINANTLY MEADOW AND WOODLAND AREAS

<i>I. Northwest Grass and Heath Lands</i>					
West Schleswig-Holstein Marsch ..	39	1	14	32	2
Central Schleswig-Holstein Geest	50	2	12	14	9
Lüneburg Heath: West	26	2	13	20	8
Lüneburg Heath: East	29	1	8	7	28
Altmark (between Lüneburg Heath and Elbe)	32	1	14	10	28
Lower Weser Marsch	13	3	24	52	—
East Frisian Marsch	38	1	11	35	2
East Frisian-Oldenburg Geest ..	23	1	15	24	8
Oldenburg-Lower Saxon Heath: West	36	1	15	16	10
Lower Saxon Heath: East	36	2	15	11	14
Middle Emsland	28	1	12	17	14
Westphalian Lowland	45	2	10	15	17
Lower Rhine Plain	40	2	7	21	17
<i>II. Northeast Glaciated Lowlands</i>					
South Mecklenburg and Uckermark Uplands	43	1	9	6	29
Havelland	37	1	23	5	26
Fläming Heath	42	1	11	1	39
Lower Lusatian Heath	32	1	10	1	46

Dominantly Meadow and Woodland Areas—*contd.*

	<i>Arable</i>	<i>Gardens and Vineyards</i>	<i>Cultivated Grass</i>	<i>Rough Grass</i>	<i>Woodland</i>
<i>III. Western Central Uplands</i>					
Rhine Massif	33	I	II	5	43
Eifel	29	I	IO	II	37
Moselle Valley	35	2	II	3	44
Hunsrück	36	I	14	I	42
Rhine Gorge	37	2	8	I	42
Bergisches Land	36	4	7	IO	30
Vorderes Siegerland	36	2	8	7	40
Hinteres Sieger- and Sauerland	24	I	7	7	56
Waldeck, Frankenberg	35	I	9	5	44
Westerwald	29	I	14	6	45
Taunus, Lahntal	37	I	IO	I	46
Teutoburger Wald, Lippe	49	2	9	7	23
Upper Weser, Lower Werra	40	I	7	6	40
Northern Hesse	39	I	12	3	39
Upper Fulda	39	I	17	3	35
Vogelsberg	34	I	21	3	36
Rhön	24	—	23	9	39
Harz	28	I	6	2	58
Thuringian Forest	37	I	11	2	40
Frankenwald and Vogtland	33	I	18	I	41
<i>IV. Bohemian Highlands</i>					
Fichtelgebirge	28	I	21	2	43
Upper Palatinate (Bavaria)	31	I	18	3	43
Upper Palatinate (Bohemia)	34	I	15	6	43
Bäyerischer Wald	36	I	23	I	32
Böhmer Wald (Bavaria)	20	—	21	2	52
Böhmer Wald (Bohemia)	28	—	20	8	42
Erzgebirge (<i>Vorlagen</i>)	51	4	14	I	20
Erzgebirge (Saxony)	39	2	11	I	41
Erzgebirge (Bohemian)	28	I	19	5	47
Elbsandsteingebirge (Saxony)	40	2	10	2	40
<i>V. South German Lands</i>					
Haardt (Pfälzerwald)	26	I	5	—	58
Spessart (with Kinzig Valley)	28	I	12	I	55
Odenwald (with Main Gorge)	34	I	10	I	50
North Black Forest	20	I	13	I	61

Dominantly Meadow and Woodland Areas—*contd*

	<i>Arable</i>	<i>Gardens and Vineyards</i>	<i>Cultivated Grass</i>	<i>Rough Grass</i>	<i>Woodland</i>
<i>V. South German Lands—contd.</i>					
South Black Forest	20	1	19	8	46
Swabian Keuper-Lias Plains . .	31	3	26	2	33
Franconian Keuper-Lias Plains . .	42	1	15	1	36
Swabian Jura	38	1	16	5	36
Franconian Jura	43	1	11	4	36
Upper Main Lowland	41	1	18	1	33
Upper Palatinate Uplands	33	1	13	3	41
Bavarian Plateau: Upper Swabia (west of Iller)	43	2	23	1	25
Bavarian Plateau: Iller-Lech Plateau (N.)	37	1	26	1	30
Bavarian Plateau: Iller-Lech Plateau (S.)	30	1	37	2	24
Allgäu <i>Vorland</i>	8	—	47	13	21
Upper Bavarian Morainic Uplands	24	1	27	3	31
<i>VI. Bavarian Alps¹</i>					
Allgäu Alpen	1	—	26	32	23 (15)
Berchtesgaden	2	—	10	8	50 (29)
Upper Inn Valley	5	—	8	28	38 (21)
Lower Inn Valley	16	1	12	10	48 (13)
Salzach Valley	14	—	12	31	37 (6)

¹ In brackets is unused land (*Ödland*).

CHAPTER 10

INDUSTRY AND INDUSTRIAL REGIONS

HISTORICAL BACKGROUND

INDUSTRY in the Middle Ages was almost exclusively concentrated in the towns and was controlled by the guilds. Every town had a variety of handicrafts, which, of necessity, owing to the lack of transport facilities, catered for the townsmen and for the country folk in the neighbourhood. They were located in relation to the market. The large cities alone were seats of specialized crafts. Western Europe in the later Middle Ages was traversed by overland routes, which were great arteries of transcontinental traffic. On these routes towns developed handicrafts which drew materials from afar and were able to market their goods over wide areas. This trade and industry developed mainly in the later Middle Ages and Nuremberg may be cited as a chief centre of such medieval history. Each of these large cities was at the same time the centre of a populous area, for which it served as a collecting and distributing centre as well as a cultural and political focus.

Already, however, in the Middle Ages, there were certain industries that of necessity were pursued outside the towns, in remote forested and upland districts, though still on a small scale and though the seats of production were small and the actual places in which they were carried on shifted from time to time. These were notably iron- and glass-making, both of which required bulky materials—ore and charcoal for the making of iron, sand and charcoal for glass-making. Metal-working—gold, silver, copper and tin—also resulted in the growth of small isolated mining communities and small smelting and metal-working establishments. Prospectors and workers were drawn into the central highlands, well above heights of 2,000 feet, that was the upper limit of rye cultivation and therefore lay above the limit of normal crop cultivation.

These conditions were further accentuated during the fifteenth and sixteenth centuries. The textile industries began to be carried on in the homes of the peasantry in the countryside in Germany, in Flanders, in northern France and in England, where they enjoyed freedom from the restrictions of the guilds. Such industries were encouraged also in areas where the law of divided inheritance caused the sub-division of holdings and left the individual with a piece of land inadequate to meet the needs of

his family. The long winter months also afforded time to carry on a craft in the quiet of the peasant's home. Metal-mining failed with the appearance of gold and silver from the New World. The iron and glass industries began to take on a more permanent character, especially when running water began to be used to drive the hammers in the forested upland that provided the charcoal. Metal-working and glass-making were similarly localized.

Especially important in the seventeenth and eighteenth centuries was the further development of peasant handicrafts, notably the textile industries. This was due to the encouragement given by the princely rulers to the emigration of Protestants from the towns and especially to the emigration of the Huguenots from France into the German states. The peasant at first used local flax, hemp and wool, and did both the spinning and weaving, his goods being dyed in a neighbouring town. These peasants had farm holdings and their craft was a subsidiary occupation. At an early date these industries depended not upon the local consumer but upon a wider, more distant market, and they were therefore organized through merchants (*Verleger*), who lived in the towns, issued the fibre or yarn, and collected the finished cloth to market it. Frederick the Great encouraged such industries in particular in Saxony and Silesia, in their poor upland districts, where the decline of mining and metal-working meant that a large, skilled labour supply was available. The rulers of the states in the south offered similar encouragement, each fostering new industries within the tariff barriers of his small state. This was the age of Mercantilism of the Enlightened Despots.

Thus, as the result of many centuries of development, there was, a hundred years ago, a widespread distribution of industry, in both the towns, which still enjoyed a medieval monopoly, and in the countryside, especially in the upland districts. This fact is clearly reflected in the density of population at this time (p. 107). The chief seats of industry and the areas with the highest densities of population were situated in the uplands along the northern border of the Central Uplands in the Sudetes, the Erzgebirge, Fichtelgebirge, Thuringian Forest, Harz, Weser uplands, Sauerland, Eifel, the Sieg valley, and, in the south, the Black Forest, the Vosges, and the Franconian Jura. The Siegerland, for instance, in the early nineteenth century, had stamping mills, charcoal-burning furnaces, tilt hammers, all using water power and exploiting the local iron ores. The same conditions were found in the Ruhr valley proper in the Sauerland long before the development of the coal-field to the north of it, and that now bears its name.

The introduction of machinery in the early nineteenth century resulted in the increased use of running water, especially in the textile industries. But the craftsman held the field until the third quarter of the century.

In the middle of the century virtually all the looms for the weaving of flax, wool and cotton were hand looms owned by peasants for whom weaving was a subsidiary occupation. The peasant craftsmen and the master craftsmen and the journeyman and apprentice characterized German industry until 1870. The spread of the factory and of steam power was slow until 1870. The weaver held his ground longest, since yarns were required in ever-increasing quantities and could be obtained cheaply from England. Yarn was imported and woven in small power-driven workshops. The small progress of steam power and of large-scale production is evident in the very small production of coal in 1860 (12 million tons).

The last seventy years have witnessed epoch-making changes in the character and structure of industry. The Thomas-Gilchrist process, invented in 1878, permitted the use of the phosphoric ores of Lorraine for the production of steel. Big advances were made in the technical side of iron and steel production, reducing the amount of fuel needed for making coke and smelting the iron. The production of lignite forged ahead. Briquetting permitted the fuel to be marketed over a wide area. The distillation of both coal and lignite resulted in the growth of chemical industries, and the latter, together with the salts that occur in the vicinity in central Germany around the Harz, resulted in the growth of a great chemical industry. Finally, electricity is a discovery of the 'eighties, and power, generated in power plants, driven by coal or lignite or water, can now be distributed over long distances so that industry can be more widely distributed.

THE CARTEL IN THE HEAVY INDUSTRIES

Concentration of industry in a few hands has been a striking feature of the economic development of modern Germany. The process of horizontal integration began in the Ruhr in the 1850s and vertical integration in the 1890s. It was well developed by 1914 under the leadership of Krupp, Thyssen, and Stinnes. No attempt was made by the Allies in 1919 to break down these syndicates. The process was, indeed, encouraged by the loss of the great plants in Lorraine, which were mostly owned by German firms, and then by the runaway inflation of 1920-3, that permitted the big concerns to buy out the small ones, and to amalgamate. This was also fostered by foreign investment (especially American) which permitted construction on a lavish scale. Thus, at the peak of this process of cartelization in 1926, several large steel concerns combined to form the *Vereinigte Stahlwerke*, with headquarters at Düsseldorf, which represented one-half of the total iron and steel production of Germany. Six chief German concerns,

all Ruhr concerns, accounted for 80 per cent of the crude steel output and 35 per cent of the coal output. In all, indeed, twenty firms controlled over 90 per cent of the coal output of the Ruhr in 1937. The Krupps concern, that began back in 1811, expanded greatly in the opening years of this century, and the whole Essen plant was turned over to armaments production in World War I, though much of it was destroyed by the Allies thereafter. The whole concern was actually on the verge of bankruptcy in 1927, when it obtained a new lease of life through credits received from American and Dutch bankers. It again became a chief seat of armaments production under the Nazis and has been considerably dismantled by the British military authorities.

The cartel has dominated the coal, steel, chemical and other industries. The big coal cartel, the *Rheinisch-Westfälisch Kohlen Syndikat*, was established, with its headquarters in Essen, in 1890, to combat over-production and control prices. This concern not only survived World War I, but formed the nucleus of the new Reich Coal Federation, that, among other things, fixed maximum prices. The coal industry was also controlled by a Reich Coal Council. The coal concern mentioned above extended to include the Aachen and Saar producers in 1934-5, so that it controlled 80 per cent of the pre-war German production. It fixed prices, organized marketing, and distributed orders to mining companies. Cartels in the iron and steel industry also date from the 'nineties and were grouped into one concern, the *Stahlwerksverband*, with headquarters at Düsseldorf, in 1904. By 1929 it had absorbed all German production. Further centralized organization, effected by personnel within the industry itself, was carried out by the Nazis in the 'thirties. The chemical industry really began with the invention of the first synthetic drug in 1888 and the opening of research laboratories at Elberfeld in 1896. The first syndicate was formed in 1904 and was expanded in 1925 to become the great I. G. Farben or *Interessengemeinschaft Farbenindustrie Aktien Gesellschaft*, with its headquarters in Frankfurt.

German industrialists were also active in international cartels for coke, steel, nitrogen, rayon, and many others. The first international steel cartel was concluded in Brussels in 1926 by industrial groups from Germany, France, Belgium, Luxembourg, and the Saar. It was motivated by the fear of excess production, and aimed at restriction of production and maintenance of prices. The British Steel Federation became a member of this group in 1935, and United States producers joined certain of the sub-cartels for tin plate, rails, and tubes, and in 1938 the Steel Export Association of America entered into an agreement with the International Steel Cartel. This structure collapsed with the outbreak of war. The Allied governments have attempted to break

down these cartels and disperse both ownership and organization of the coal, iron and steel, and chemical industries. The combines are to be replaced by a large number of independent concerns that are expected to compete with each other in the domestic market, and the military authorities exercise an overall control. The Schuman plan is an attempt to re-establish closer economic union of the steel producers of western Europe on a different basis. It still remains to be seen how far these policies will succeed in terms of efficiency of production in the best interests of producers and consumers.

Industrial Concerns of Germany in 1939 (Statistisches Handbuch von Deutschland, p. 244)

	No. of Concerns	No. Employed
Mining	2,179	725,017
Stone and Earths	38,140	674,920
Iron and Steel	3,621	549,778
Metals	2,652	149,771
Iron, Metal and Steel Goods ..	147,993	1,102,648
Machinery and Vehicles	63,212	1,811,908
Electro-technical	32,297	639,633
Optical and Precision Instruments	27,240	227,912
Chemicals	12,036	476,496
Textiles	140,275	1,278,976
Paper	22,969	294,682
Printing and Publishing	28,675	239,822
Leather and Linoleum	32,881	163,636
Rubber and Asbestos	2,680	77,989
Timber and Woodworking ..	206,996	889,298
Musical Instruments	15,679	62,140
Food and Drinks	320,407	1,539,576
Clothing	501,994	1,215,632
Building Trades	244,195	2,217,648
Water, Gas, Electricity	11,226	215,990
TOTAL	1,865,347	14,533,472

The purpose of this chapter is to examine the character and location of industries. Reference is made throughout to the pre-war situation. Industry is located in terms of a variety of factors—raw materials; transport facilities for the assembly of such materials and the distribution of the manufactured product to a further producer or to the consumer; or the availability of an adequate labour supply. There is a remarkable strength of persistence in any going concern in the face of changing conditions that affect its fortunes. Especially does this apply to industry in which concerns established in the past keep up with new conditions by adapting

their organization, equipment and skills to new, though related, lines of production. Especially does this apply to skilled fabricating industries. The presence of a great reservoir of labour is also an invitation and stimulus to the growth of industry. This has been particularly true, for instance, of the varied industrial history of the densely peopled though poverty-stricken lands (from the standpoint of crop-growing) of Saxony. Finally, we should note that while industries may be located for reasons either of accessibility to bulk materials, or for reasons of historical development and labour supply, the majority of industrial activity is located with immediate reference to the consumer. The biggest range of industries and most of the industrial workers are located proportional to the distribution of population.

Industries by Political Divisions in 1939 (Statistisches Handbuch von Deutschland, p. 245)

	No. of Concerns	No. Employed
Bavaria	251,970	1,580,277
Hohenzollern Land	3,370	15,043
Württemberg	109,414	760,390
Baden	71,839	551,222
Hessen	41,728	290,674
Hessen-Nassau	72,383	518,502
Bremen	8,424	120,153
Saarland	12,221	199,283
Rheinprovinz	175,335	1,805,792
Westfalen	120,820	1,226,570
Lippe	6,615	33,545
Schaumburg-Lippe	1,539	9,214
Hannover	89,197	572,246
Braunschweig	14,464	128,670
Oldenburg	11,992	68,186
Hamburg	35,383	349,122
Schleswig-Holstein	37,069	239,317
Mecklenburg	18,083	113,929
Brandenburg	67,036	542,155
Prov. Sachsen	90,272	780,558
Anhalt	8,846	104,613
Thüringen	68,245	468,005
Sachsen	234,653	1,602,985
Berlin	115,386	1,176,863
Schlesien	108,948	791,715
Pommern	48,365	257,961
Ostpreussen	41,750	246,472
TOTAL	1,865,347	14,553,472

The industries of Germany in 1939 are tabulated above with respect to the number of concerns in each group and the number of people employed in them, together with the proportions for the Reich as a whole. It will be seen that the iron, steel and metal industries employ over a quarter of the total employed population, and the textile and clothing industries, if combined, employ one-fifth. These two groups of industries together account for about one-half of the industrial population. Mining and quarrying account for 12 per cent and the food and drink industries, together with the building trades and water, gas and electricity undertakings, for about a quarter of the total. Of all these industries, about one-third of the people are in industries that are highly localized in particular places either on grounds of early pre-industrial development or of the bulky materials which they produce. The remaining two-thirds are related to the distribution of population and transport facilities.

We may now turn to consider the location of the major industries of Germany. These are based, above all, upon the production of natural resources, especially of fuel and minerals, and to these we shall first give attention, with emphasis on the geographical location of each group.

POWER (Figs. 35 and 36)

Coal production reached 150 million tons in 1928 and a peak of 190 million tons in 1943. The chief seat of production is the Ruhr district. Three-quarters of Germany's (1928) bituminous coal came from this area (115 millions). A short quarter came from Upper Silesia (20 millions) and the Saar (10 millions) together. Both the Silesian and Saar fields are lost to Germany. There are several small fields scattered along the northern border of the Central Uplands, linked up with the chain of fields that extends west from Upper Silesia, through the Ruhr to central Belgium and northern France. The chief of these are: Aachen in the extreme west (5.5 millions), Waldenburg in a hill-enclosed basin in the Sudetic uplands in western Silesia (5.5 millions), the small Zwickau and Lugau-Oelsnitz fields in Saxony (4 millions), and several small fields near Osnabrück and Hanover (under a million tons).

Lignite or Brown Coal production reached 165 million tons in 1928 and a peak of 253 million tons in 1943. Brown coal is a low-grade fuel, intermediate between bituminous coal and peat. Nine tons of lignite equal in heat value two tons of bituminous coal. It occurs in deep measures near to the surface beneath the rich farmlands on the northern edge of the Central Uplands. It is obtained from vast quarries, and the material is rid of its water and waste for the production of briquettes; or it is fed direct as a fuel into furnaces for the generation of electricity and for the manufacture of chemicals; or it is distilled by low-temperature

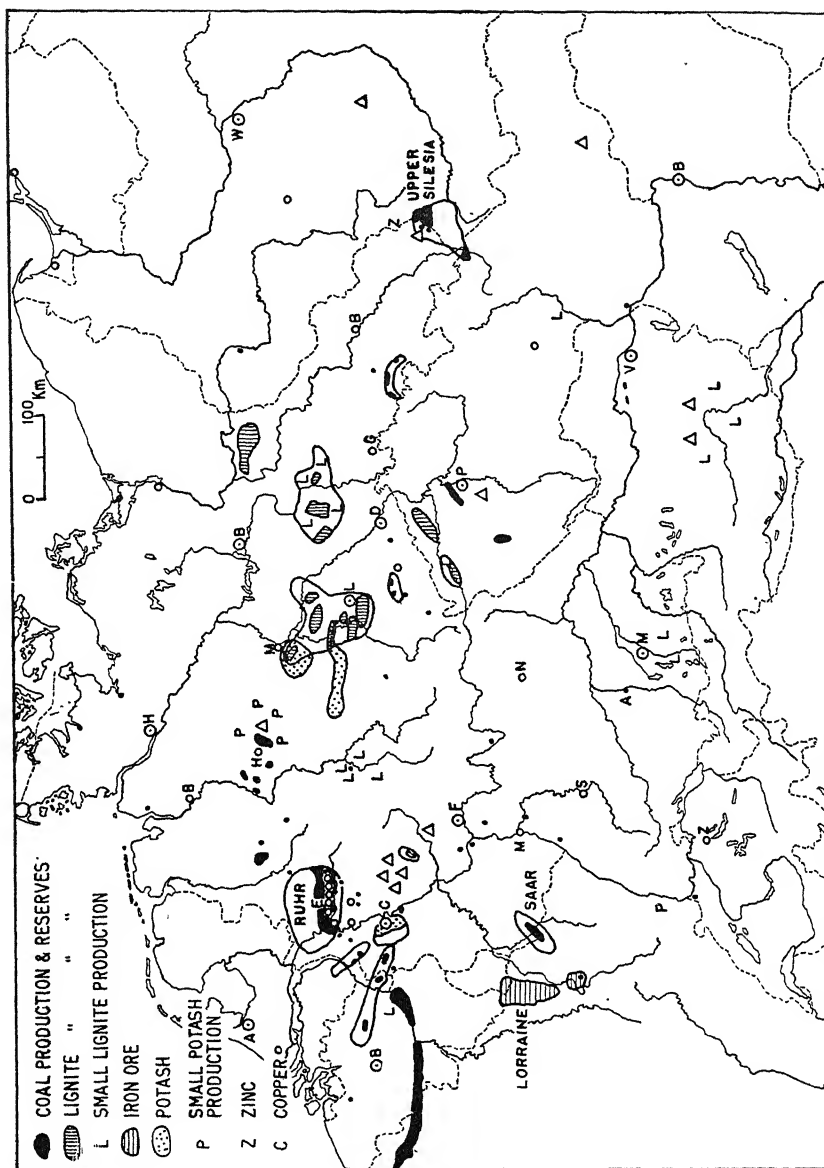


FIG. 35—CENTRAL EUROPE: NATURAL RESOURCES (scale, 1 : 10 m.)

carbonization processes for the production of tar, oil and chemicals. The great advance in the use of lignite has come about during and since World War I and has been responsible for a new industrial revolution in Germany, the importance of which is not generally appreciated. There are two chief areas of production. The first is in the lower Rhineland, in the Cologne Bay on the west bank of the Rhine a few miles from Cologne. It is sufficiently near to the Ruhr to have developed in the closest economic association with it. Nearly 30 per cent of the pre-war production came from this area. The second is in central Germany in the

Coal Production (in millions of tons)

	1913	1938	1947	1949
Ruhr-Westphalia	114.5	127.3	66.3	96.3
Upper Silesia ..	43.8	26.0	?	?
Saar	13.3	14.4	10.5	14.2
Waldenburg ..	5.5	5.3	?	?
Aachen	3.3	7.7	3.2	5.1
Saxony	5.5	3.7	2.7	1.9
		(1937)		
Others	4.1	2.1	—	—
		(1937)		

Lignite Production (in millions of tons)
(*Deutschland-Jahrbuch*, 1949)

	1938
Central Germany ..	83.8
Cologne Area ..	58.4
East of the Elbe ..	49.9
Other areas ..	1.3
TOTAL ..	<u>193.4</u>

bay of lowland in whose centre is Liepzig-Halle. The field extends from near these cities northwest to Magdeburg and Hemlstedt. Another field lies to the east of the Elbe in Lower Lusatia. This whole area produces about 70 per cent of the total production, with the two main seats in the Halle-Merseburg area (Thuringia and Saxony), producing a good third, and Lower Lusatia a good fifth.

Just over a third of the lignite is used for domestic purposes, nearly a quarter for electricity generation, and about a tenth for the chemical industries. Smaller quantities are used in metallurgical, glass, pottery and textile industries. A great diversity of uses accounts for another fifth of the production.

Oil. Germany has a production of crude oil of nearly a million tons. The production increased rapidly after 1929 (100,000 tons)

through the sinking of new wells in the district of Nienhagen around Hanover and Brunswick. (The first well was sunk near Celle in 1859.) This area yielded nine-tenths of the production, that reached about one million tons in 1942. The annual consumption of oil before the war reached 7 million tons. Five million tons were imported, almost all of which was refined in the Hamburg district. The balance of 2 million tons was provided by production of synthetic fuel. This industry was further developed in Germany than in any other country. The fuel is obtained from coal and lignite by hydrogenation and other processes. The big plant of the Leunawerke was established in 1927 for this purpose. During the Nazi regime production experienced a tremendous increase from half a million to three and a half million tons in 1941. The Bergius hydrogenation processes use coal, lignite and tar oil as raw materials, and the Fischer Tropsch synthetic plants use coal and coke. Low-temperature carbonization obtains gasolene and diesel oil from coal. About twenty synthetic oil plants were in existence at the outbreak of war and since they consume enormous quantities of raw materials they are situated near to the latter. The hydrogenation plants—above all the Leunawerke—are near the lignite fields of the middle Elbe basin. The Fischer Tropsch plants, that use coal and coke, are situated on the Ruhr coal-field. All except one are to be dismantled.

Electric Power. Germany has the greatest installed capacity and production of electricity of all the countries of Europe. There are over 7,000 generating stations, but under 300 of these account for four-fifths of the production. Of the total production nearly 60 per cent was due to publicly owned concerns. Private electricity concerns are concerned with the electro-chemical and electro-metallurgical industries, coal and lignite mines, and iron and steel works.

Four-fifths of this total production was derived in 1937 from coal and lignite and a seventh from water power. Lignite was a slightly more important source than coal, accounting for 40 per cent of Germany's total production, whereas coal accounted for 36 per cent of the production. The power plants fed by coal are situated in the seats of industry and population where the power is consumed, for coal can be relatively cheaply transported. Lignite, on the other hand, is very bulky with low heat value, and it is friable when dry, and difficult to transport. In consequence, the lignite-consuming plants are situated at or near the lignite fields and then electricity is transmitted to the consumers by cable. The hydro-electric stations are tied to the seats of water power and are situated mainly in south Germany.

Thus, the lignite field of Ville (west of Cologne) and the Leipzig-Halle field are the two chief seats of lignite for the electricity plants. The coal-fed plants of the Ruhr and Saxony respectively are intimately

related to these two. The hydro-electric plants are in two groups, one in the upper Rhine, the other in the Bavarian Alps. The many other plants are situated for the most part in the towns and depend upon transported coal.

The Ville and Leipzig-Halle areas include the greatest of Germany's plants, and in the latter in particular they are closely associated with chemical works, aluminium smelting works and synthetic oil plants, so as to form a widely spread, though closely knit industrial complex. Two large stations on the German Upper Silesian coal-field were developed in connection with synthetic oil plants during the recent war.

The hydro-electric plants on the upper Rhine are small (under 100,000 kilowatts) and several are operated jointly with Switzerland. They are usually formed by damming the river. Though the power is for general use, the chemical works at Waldshut and the aluminium works at Rheinfeld are supplied. Bavaria has three main plants that supply the German railways, Munich, and local aluminium and chemical works. Other plants in Germany lie on the Ruhr (Herdecke based on the Hengsteysee, formed by damming the Ruhr), at Waldeck (formed by the dam on the Eder near Kassel), and on the Saale, where there are four stations.

We may note the distribution and capacity of the chief plants on the eve of World War II. Nearly 90 per cent of the production was due to the industrial consumers—the chief being synthetic oil plants, mining and the iron and steel industries, and aluminium and calcium carbide industries. Domestic consumption accounted for 8 per cent and traction for about 4 per cent.

METALS

Iron Ore. Germany was a chief producer of non-ferrous and iron minerals in the Middle Ages and after. But they occurred in small quantities in the upland areas and production waned and virtually ceased in the last centuries. Iron is the basis of all modern industry, but in Germany it only occurs in small quantities in scattered areas. The seats of the early iron working were in the Siegerland, the Mark, the Saar, the Ore Mountains (*Erzgebirge*) and the Thuringian Highland. Most of these have ceased production in the face of modern competition. The chief areas of modern production are the Sieg, Lahn and Dill valleys in the Rhine Plateau, on the east side of the Rhine and south of the Ruhr industrial area. Here today there are still iron-working plants as the direct lineal descendants of their pre-industrial predecessors. A further area was discovered during the nineteenth century in the Ilsede-Peine district between Hanover and Salzgitter and here the new Göring works were established, though they have been largely dismantled. Smaller supplies are drawn from Bavaria and the Vogelsberg.

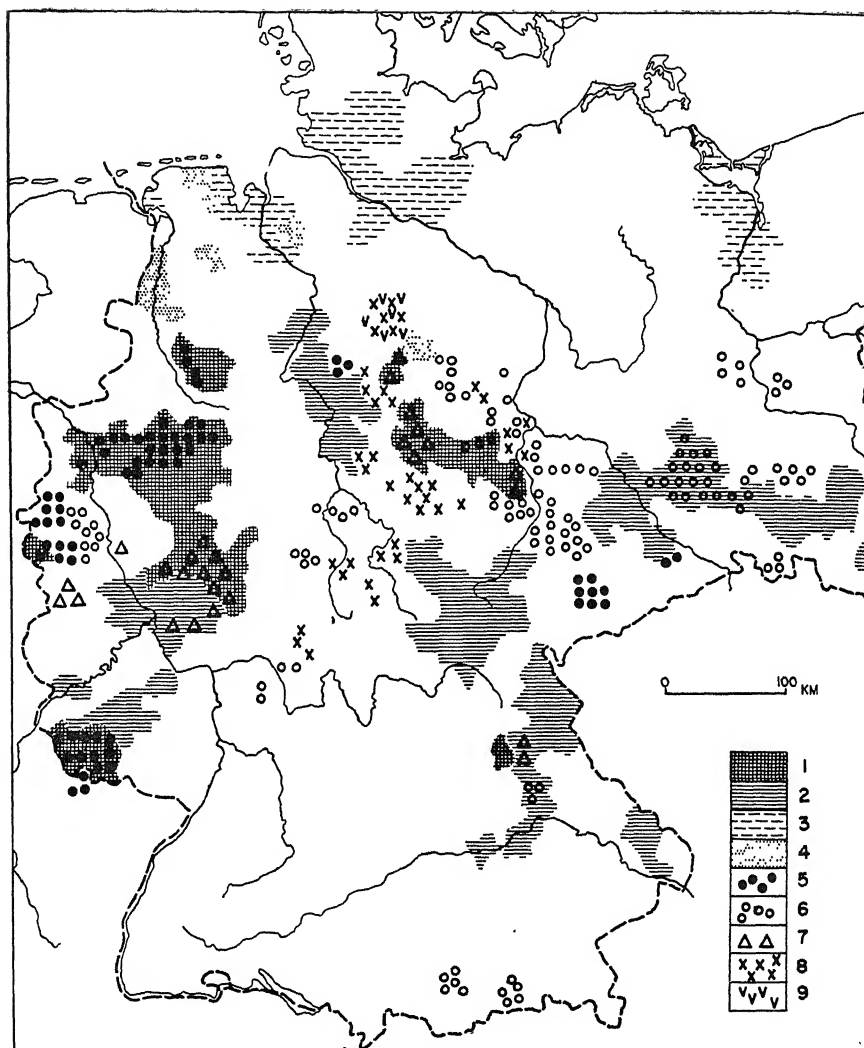


FIG. 36—GERMANY: EXTRACTIVE AND HEAVY INDUSTRIES (pre-war)
(from Von G. Crispendorf) (scale, 1 : 6 m.)

Based on occupations by *Kreise*.

- | | |
|-----------------------------------|----------------------------|
| 1. Heavy industries | 5. Coal |
| 2. Quarrying of stones and earths | 6. Lignite (or brown coal) |
| 3. Coastal (port) industries | 7. Iron ore |
| 4. Peat | 8. Salt |
| | 9. Oil |

Before 1918 Germany's iron supplies were drawn from German Lorraine, which produced some 20 million tons annually, and Germany was 70 per cent self-sufficient. Since 1918 Germany has been 25 per cent self-sufficient. In order to diminish this dependence the Nazis increased production, mainly from the two areas noted above, to some 12 million tons in 1938, although the iron content only reached 3 million tons. The proportion of domestic production in 1937 amounted to a third in Siegerland, a fifth in Peine-Salzgitter, a tenth in the Lahn-Dill area, 8 per cent in the Vogelsberg, and 8 per cent in Bavaria. In 1937 Germany imported 20 million tons (half from Sweden, 15 per cent from Lorraine) as well as using nearly 10 million tons of scrap iron annually from the country and about 1 million from abroad. Total production in 1947 was 4.5 million tons, but rose to 11 million tons in 1950.

Iron Ore Production 1946-7 (thousands of tons)
(from *Deutschland-Jahrbuch*, 1949, p. 169)

<i>British Zone (1947)</i>	<i>American Zone</i>	<i>French Zone (1946)</i>
Salzgitter .. 1,337.0	Nordbayern .. 82	Siegerland .. 191
Ilsede .. 503.0	Oberpfalz .. 294	Baden .. 56
Rest of Harz	Württemberg .. 190	Lahn .. 14
Foreland .. 351.0	Lahn-Dill .. 296	
Wiehengebirge .. 4.8	Waldeck .. 24	
Wesergebirge .. 215.0	Vogelsberg .. 360	
Sauerland .. 18.0	Taunus-Hunsrück 23	
Siegerland .. 190.0		
TOTAL .. 2,618.8	TOTAL .. 1,269	TOTAL .. 261

Non-ferrous Metals are produced in very small quantities and the bulk is imported. Copper is mined in the Mansfield district at the eastern end of the Harz, but home production of about 25,000 tons accounts for only 15 per cent of the consumption and large quantities are imported, with Hamburg controlling half of the refining capacity. Lead and zinc, that normally occur in combination, are mined in the Harz, Upper Silesia and in the Eifel Plateau, and Germany ranked as the greatest producer of zinc in Europe and was second to Yugoslavia in lead production. Production of both was stimulated by the Nazis, but home supplies of over 2 million tons of ore were inadequate to meet the demand and she imported considerable quantities. Through the loss of Upper Silesia by the Versailles Treaty, Germany lost 60 per cent of her zinc production and 23 per cent of her lead. Smelting plants, producing about 200,000 tons of zinc and lead each, are situated near the ore mines and on the coal-fields. The chief are the Busbach plant near Aachen, the Braubach plant at the

confluence of the Lahn and the Rhine, and Oker and Langelsheim near Goslar. Consumption of lead and zinc was about 300,000 tons each in 1938.

Tin resources are negligible, and imports of ore in normal years amount to nearly 10,000 tons, and of metal about 10,000–15,000 tons. Duisburg and Essen do almost all the smelting. A third is used for making tin-plate. Aluminium production increased in the 'thirties (to 200,000 tons), and imports of bauxite, which Germany lacks, increased. In 1938 Germany was responsible for over a quarter of the world production of aluminium (more than the United States) and imported from Yugoslavia and Hungary. Smelting is effected by electrolysis so that the reduction plants are situated near the power plants. Magnesium, that is used as an alloy with aluminium, is obtained by electrolysis from molten magnesium chloride that in turn is derived from magnesite. This industry is centred on the potash deposits of Stassfurt, where magnesium chloride is extracted as a by-product in the preparation of potassium chloride. This area is responsible for about a half of the world production. Nickel deposits are negligible, the only producer being Frankenstein near Breslau (1,000 tons), so that her pre-war consumption of 10,000 tons of ore had to be imported. Germany produced before the war 7 per cent of the world's manganese, 4·5 per cent of the lead, 9 per cent of the zinc, 1·3 per cent of the copper ores. In 1938 Germany produced 3·4, 12·4, 11·3, and 2·2 per cent of the world smelter production of copper, zinc, lead, and aluminium respectively.

MAJOR INDUSTRIES (Fig. 37)

Iron and Steel Production. The vast range of the iron and steel industries falls into four main groups—iron and metal production, iron and steel wares, machinery and vehicles, and the manufacture of electrical, optical and other precision instruments. All these industries depend in varying degree on the production of metals, ferrous and non-ferrous, at the furnace, and it is with the production of iron and steel that we shall commence.

Germany was second only to the United States as a producer of iron and steel. The peak of her pre-war production came in 1938 with an output of 18 million tons of pig-iron and 22 million tons of steel. This supremacy was due to the great resources of coking-coal, whereas nearly all her iron ores were imported. The iron ore situation has been noted. The industry was built up before World War I on the basis of the free exchange of the coke and coking-coal of the Ruhr for the iron ore or pig-iron of Lorraine and Luxembourg, and the Saar. The two areas had a normal pre-war output of about 10 and 15 million tons of steel each.

In the last thirty years the German industry in the Ruhr has been dependent almost entirely on imported supplies, drawn largely from Sweden, up the Rhine and up the Dortmund-Ems canal. Four-fifths of

Germany's crude iron and steel is drawn from the Ruhr, while the secondary areas are located near the ore-fields of the Siegerland, Lahn-Dill, Upper Silesia, and the Ilse-Peine district. The Ruhr enjoys the supreme advantage of transport by the Rhine. Upper Silesia suffers from the fact that its coal is not well suited for coking and, moreover, it has negligible quantities of ores, as well as inadequate transport facilities for the conveyance of coke and ore by water. The Oder has recently been brought into direct contact with the field by the opening of the Adolph Hitler canal from Kosel, but the Vistula is not navigable to the Polish field. Secondary smelting centres are found in the northern ports of Hamburg and Bremen, using imported ores and either Ruhr or English coal, and these plants supply their shipbuilding industries.

Reference must here be made to the production of coke. Coke is almost entirely derived from the Ruhr coals, and production reached the abnormal figure of 43·5 million tons in 1938. Three-quarters of the production normally came from the Ruhr and only 7 per cent from the Saar, and 4 per cent each from Aachen and Upper Silesia. One-half of this coke production was consumed by the iron and steel industry, and a third for domestic heating. Exports reached nearly 10 million tons in 1938. The ores are carried to the coking-coal areas of the Ruhr, Saar, and Upper Silesia; or the coke is carried to the ore-mining areas, since, as in Lorraine and other minor German areas, the ore is low-grade and the wagons that carry the ore to the Ruhr can return filled with coke.

After World War I, Germany lost 80 per cent of her iron ore, 40 per cent of the pig-iron output, 40 per cent of the crude steel output, and 30 per cent of the rolling mills, by the loss of Lorraine, the Saar, and the withdrawal of Luxembourg from the German customs union. The rehabilitation was effected by subsidizing domestic production of iron in the Siegerland, and by importing larger quantities, favoured by low freight rates on the railways, and subsidies to the manufacturers. New equipment and vertical integration also helped to bring production to normal during the 1925-9 boom. Production fell to an inter-war minimum in 1932 with an output of 3·9 million tons of pig-iron, 5·8 million tons of crude steel. But after 1933 production leaped up far beyond the more normal level of production in the middle 'twenties. In 1938 pig-iron production was 18 million tons, steel 22·5 million tons.

Heavy Engineering Industries. The blast furnace, the steel converters, and the rolling mills, are tied down to sites where the coke or the iron ore is produced or where it can be cheaply assembled. The end products are plates, sheets, rails, girders, wires, that is, semi-finished products (or, in the earlier phase, steel ingots and steel castings) which are shipped for further manufacture and finishing processes elsewhere.

In general, these heavier engineering industries are highly located

in the Ruhr. The older seats of iron and metal-working have to some extent maintained themselves, partly by using local iron, partly by importing it, and also by importing fuel. They have concentrated on the production of goods of high value and variety that demand relatively little material but a high degree of skilled labour in their production and considerable enterprise in their management. Thus, the old workshop industry of the *Bergischesland* appears today in the cutlery-working district of Solingen and Remscheid, and the Sauerland (or the *Märkischesland*) retains its speciality of small iron wares, such as wire products and nails, bolts and screws. Varied iron-working industries of a similar character, notably the production of ironmongery, are carried on in Thuringia and Saxony.

The great bulk of the fabricating industries, however, are carried on near the seats of iron and steel production or in the big cities. Thus, shipbuilding and marine engineering are concentrated in the northern ports, especially Bremen and Hamburg, and in 1938 these ports launched 15 per cent of the world's new shipping tonnage, second only to Britain's contribution of one-third. Over three-fifths of this German tonnage was launched in the estuaries of the Weser and the Elbe. Hamburg is the giant and the Deutsche Werft A.G. had the largest shipping output of any single concern in the world in 1938, and the yards of Blohm and Voss are world renowned. Marine engineering is carried on near or within the shipyards, or at some inland centres where special marine engines are produced. The production of locomotives and railway stock is located at the great railway centres as well as on the Ruhr. The plants at Kassel, Essen and Berlin are the chief. Rolling-stock production is more widely distributed among the bigger cities. Heavy machinery (such as furnaces and rolling-mill installations, oil and gas engines, turbines and boilers) is mainly manufactured in the lower Rhinelands, especially on the Ruhr, but plants are also found in the large cities. The engineering industries of the Ruhr are thus particularly concerned with the equipment of the basic industries of the coal mine, the furnace, the rolling mill, and the railway. The production of agricultural machinery is located in contact with the main consuming areas, namely, the chief agricultural areas in the middle Elbe basin (Magdeburg, Hanover and Leipzig), Silesia (Breslau), the lower Rhinelands (Düsseldorf and Cologne); and a few establishments are located in the Ruhr itself.

Light Engineering Industries. The above groups of iron and steel industries are, in the main, the "heavy engineering industries", that are located at the source of the raw material or where these can be cheaply assembled and the end products cheaply marketed. They fall mainly in the category of "iron and steel" in the German census classification as summarized on p. 231. The other three main groups so listed are

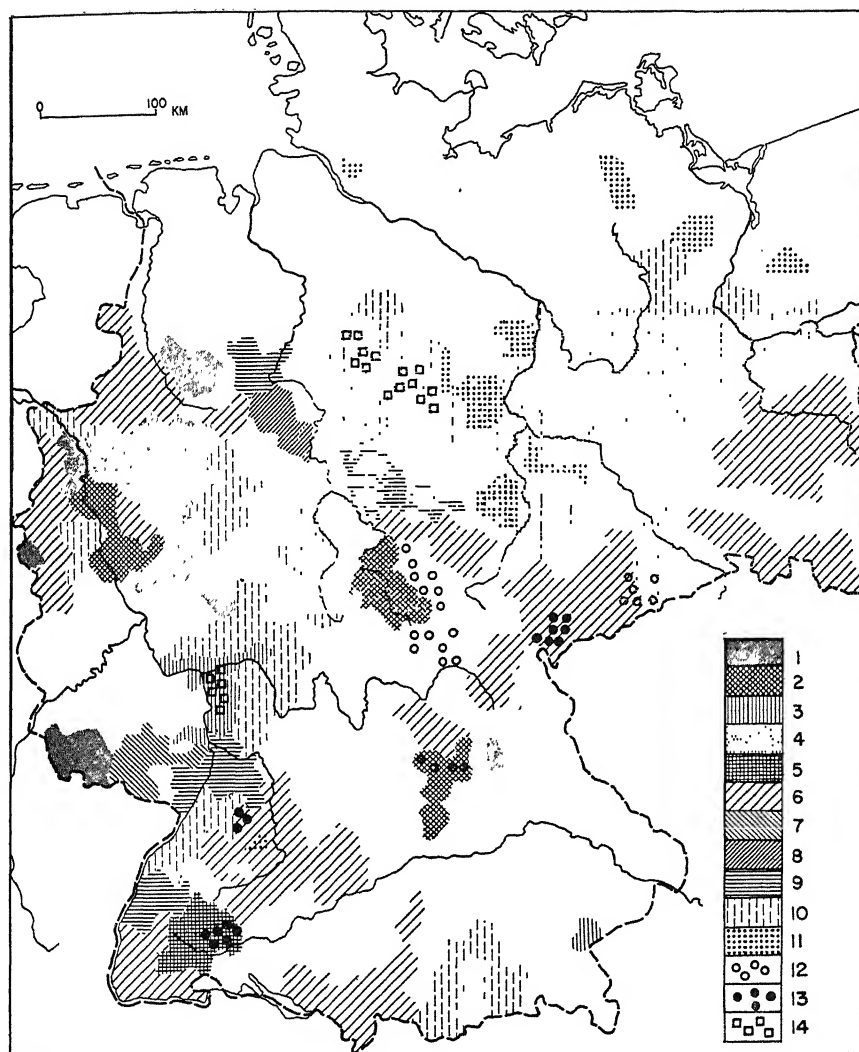


FIG. 37—GERMANY: MANUFACTURING INDUSTRIES (pre-war) (from Von G. Crispendorf) (scale, 1: 6 m.) Based on occupations by Kreise.

- | | |
|---------------------------|-------------------------|
| 1. Heavy Industries | 8. Wood and paper |
| 2. Iron and metal working | 9. Tobacco |
| 3. Chemicals | 10. Mixed industries |
| 4. Electrical | 11. Sugar |
| 5. Optical, etc. | 12. Toys |
| 6. Textiles | 13. Musical instruments |
| 7. Leather | 14. Food preserves |

the manufacture of metal goods; of machinery, apparatus and vehicles; and electro-technical and precision instruments. While the machinery and electrical industries are mainly concentrated in large establishments, iron and metal goods are produced in numerous smaller concerns, and include a good deal of handicraft work carried on as domestic and small workshop industries. The machinery industries are widely distributed in big centres in relation to the regional markets. The electrical industries are almost entirely concentrated in a few large cities, the chief being Berlin. The iron and metal-working industries are chiefly concentrated in Rhineland-Westphalia (in fact, over a quarter of all workers) and in Berlin. The electrical industries, the production of machinery, apparatus and vehicles, and iron- and metal-working, accounted for three-fifths of the workers of Berlin. The *Land* of Saxony (as opposed to the Prussian province of that name) was the third area of concentration of these skilled finishing industries.

The production of machine tools (which made a substantial contribution to Germany's pre-war exports) demands skilled labour and, unlike the heavy engineering industries, just noted, that are markedly localized on the coal-fields, these are found in the great reservoirs of labour in the big cities and in the older mining and metal-working areas in the central highlands where the traditions of skilled craftsmanship are maintained and the labour is available. This applies especially to the many small towns in the Sauerland, south of the Ruhr, and to the Thuringian Highlands.

The production of motor vehicles increased by leaps and bounds after 1933, and in 1938 exceeded that of France and was not far behind Britain. The production was controlled by a few firms and located in large plants in a few centres. Outstanding was the Opel plant at Rüsselsheim between Mainz and Frankfurt, that supplied two-fifths of the cars and a third of the commercial vehicles in Germany in 1938. The second great firm was the Daimler-Benz concern, with plants, producing aircraft engines and armoured vehicles, at Stuttgart, Berlin, Mannheim and Gaggenau near Karlsruhe. The chief Ford works was at Cologne and the Adler works was at Frankfurt. The *Volkswagen* was made at Fallersleben. Other plants were situated in other cities. Production of motor-cycles also increased tremendously, with chief centres at Nuremberg, Neckarsulm (near Stuttgart) and Schweinfurt.

The *electrical industries* were largely controlled by the Siemens combine and the Allgemeine Elektrizitäts Gesellschaft. Both had their chief establishments in Berlin, although plants are situated elsewhere in Germany. Optical and precision instruments are produced in small factories with highly skilled labour and plenty of it. They are produced mainly in the old-established industrial areas of the central highlands, where they have concentrated in large measure in factories in the towns during the

last seventy years. Thuringia, Saxony, Württemberg and Baden are outstanding, although, once again, Berlin has attracted a large quota of production in the last decades. The best-known centre is that of the Carl Zeiss works at Jena, where social welfare of the workers was a marked feature of its organization. Dresden is also an important centre.

The manufacture of clocks is still pursued in the Black Forest, especially in factories in the towns of Pforzheim, Villingen, Schwenningen and Schramberg. There are many firms in the small towns of Bavaria with Munich and Nuremberg as the outstanding centres.

The Chemical Industries. Though employing a small number of workers in relation to other industries, these are of the greatest importance in the economic life of an industrialized country. Their development has been synonymous with the advance of modern chemistry and extends over less than a hundred years, and did not really take an effective start until the 'seventies. The two chief stimuli to progress were the manufacture of artificial fertilizers from potash salts and coal, based on the use of sulphuric acid, and the production of artificial dyes through the distillation of coal tar. The production of photographic materials and pharmaceutical apparatus followed in the 'eighties. The opening of the twentieth century witnessed the extraction of nitrogen from the atmosphere, and epoch-making discoveries have since been made in the further treatment of coal and lignite for the distillation of oils and a great range of by-products. The heavy chemical industries, that are concerned with the large-scale production of bulky chemical products from bulky raw materials, are tied down rigidly to the location of the latter or where they can be assembled by water. Water is also consumed in tremendous quantities by these industries and a river site is essential for many of them. Thus, there are three main areas with modern mammoth chemical plants—the lower Rhineland, both on the coal-field and on the Rhine front; the middle Elbe basin (or Central Germany), where the plants are located in relation to either the potash salt mines or the lignite quarries; and the middle Rhine area on the river front, like the great plants at Ludwigshafen and Mannheim and near Frankfurt, where materials are assembled and large quantities of water needed in the processes are readily available. The light chemical industries, that produce a tremendous range of consumer goods (as opposed to the production goods produced by the heavy industries), such as pharmaceutical products, photographic supplies, perfumes, soaps, etc., are not tied down to their raw materials by consideration of transport costs, so that they are fairly widely distributed, and are located for the most part in the towns.

Germany is a large producer of both rock salt and potash salt. She is responsible for 60 per cent of the world production of the latter that forms a primary source of her great chemical industries and especially of the

production of fertilizers. These salts occur in the New Red Sandstone rocks of central Germany and are mined in three main areas in the middle Elbe basin—namely, Stassfurt, Eisenach, Nordhausen and Magdeburg. The beds overlie beds of common salt and are mined in shafts. The salts are refined for use as fertilizer or used for the preparation of potassium salts, that are used in the manufacture of glass, fertilizers, explosives, soap, etc. Production more than doubled after 1933 and reached 16 million tons in 1938. Common salt is mined not only around Stassfurt, but also at Reichenhall near Salzburg, at Schöningen, and near Lüneburg. The greater part of the salts are refined on the spot. About a million tons are used as fertilizers and over half a million tons are exported to the neighbouring countries of Denmark, the Netherlands and Belgium.

Sulphuric acid is the chief inorganic chemical used in these industries. It is derived mainly from pyrites, some of which is produced in the country, though over a million tons were imported annually. Small quantities of zinc blende and galena are also used for the purpose. Most of the plants producing this acid are situated in the lower Rhineland, but the largest are at Leverkusen, Höchst (near Frankfurt-on-Main) and Mannheim-Ludwigshafen, the last producing about a fifth of the national output. The middle Germany area also produces about a fifth of the output. The Leuna (near Merseburg) and the new Elsnig plant may be given special notice here.

Salts are the basis of the production of alkalis—that is, of potash, caustic potash, and soda ash. The sodium compounds are used for the making of soap and for washing and bleaching textiles and in the manufacture of glass and of cellulose products. The production of caustic soda and soda ash was greatly stimulated by the growth of the cellulose industries, notably the production of rayon. Soda ash is produced at two great plants at Bernburg, near the Stassfurt salt area, and at Rheinberg, near the coke supplies of the Ruhr. Caustic soda is produced by electrolysis in plants in various parts of the country, the chief plants being at Bitterfeld, Höchst and Leverkusen.

The extraction of nitrogen from the air was encouraged during World War I when Germany was cut off from her sources of imported nitrates in Chile. Many products are derived from the distillation of coal. Ammonia is obtained in the burning of coal for use in the chemical industries. Lignite is also used in place of coal, so that these industries again are tied down to the coal and lignite fields. The Leunawerke and the I.G. Farben plant at Oppau at Ludwigshafen accounted for four-fifths of the production of synthetic nitrogen. Other plants are on the Ruhr coal-field. The Leunawerke produced alone about two-thirds of the total. One million tons of synthetic ammonia were produced by the fixation of atmospheric nitrogen and were used mainly as fertilizer.

The distillation of coal tar and lignite is the basis of another range of chemical industries. Low-temperature carbonization for the production of fuel oils is used mainly on lignite. High-temperature carbonization of coal produces coke or coal gas, and the coal tar is distilled further to yield both heavy and light oils. The treatment of these yields dyestuffs, pharmaceutical products, explosives, etc.

It will be clear that the majority of the distillation plants are situated on the Ruhr coal-field, where the coke is made, though many plants are found in the big cities in connection with the gas works. The dyeing industry was controlled by the I.G. Farben, with its chief plants at Ludwigshafen, Uerdingen (near Krefeld), Offenbach (near Frankfurt-on-Main), and Leverkusen. Other plants are at Höchst and Griesheim, both between Mainz and Frankfurt. Plastics and cellulose, paint and varnishes were made from tar acids through the distillation of coal and lignite. The basis of these industries was the synthetic resins that were made by the big chemical syndicates, although the fabricating industries are carried out in numerous small plants scattered throughout the country.

The Rubber Industry before the war was based on imports of natural vegetable rubber that reached 100,000 tons in 1937. The chief centre is Hanover, but other plants were situated in the big cities. One-half of the production of rubber tyres was drawn from the Hanover district alone. Miscellaneous rubber goods were produced in many factories at scattered locations. The production of artificial rubber was still in the experimental stage at the outbreak of war but made considerable progress during hostilities, the chief plants being at Schkopau, near Leipzig, and Hüls, near Cologne.

Textile Industries. The textile industries come second to the iron and steel group according to the numbers employed, if one includes the clothing industries as well. The textile industries proper, however, that produce yarns and cloths, account for only one-tenth of the industrial workers. They appear as the dominant industries in three areas. The first extends from the Sudetes highland in western Silesia, thence through Saxony west of the Elbe and into northeastern Bavaria, at the town of Hof, and into central Thuringia, at Erfurt. The second area is in the lower Rhineland and is contiguous with a similar area across the Dutch frontier at Enschede. The third area is in the southwest in the Neckar basin, the upper Rhine (at Mühlhausen and Freiberg), and between Lake Constance and Augsburg. These industries were well established in these areas before the advent of modern power-driven machinery.

In all these areas the cotton industries were the last to appear but they are now well represented. They were introduced here in the late eighteenth and early nineteenth centuries, fostered by the Continental blockade by the British Navy and took the place of the earlier flax

industry that was then decadent. The three chief areas are Saxony, the lower Rhinelands and Württemberg. The woollen textile industries were first domiciled in the early Middle Ages (before A.D. 1000) in the northwest, in Flanders, Friesland and Münsterland; and in the towns of the southwest, such as Regensburg and Augsburg. Frederick the Great of Prussia encouraged the making of woollen goods in the Sudetes highlands where local wool was used, of which Prussia had an export surplus until the great decline in the numbers of sheep in the middle of the nineteenth century. The chief centres today of the woollen industries are in west Saxony and central Thuringia. In the northwest, the old domestic industry is now concentrated in factories that are mainly located in the small towns of Aachen and Düren. These industries are today of very little importance in the south. The making of linens from locally grown flax, that was formerly so very widespread as a domestic craft, disappeared in most districts with the growth of the cotton industries in the eighteenth century. Its remains are now associated with the cotton-manufacturing areas, the chief being in Lusatia at Zittau and Lauban, and especially in the Sudetes in west Silesia and in the extreme southeast corner of Saxony. There are two surviving seats of knitting and embroidery making, both of which are pursued as domestic crafts organized from town centres; these are in Saxony between Chemnitz and Plauen and Württemberg, in a large number of villages and small towns around Stuttgart. The German jute industry is the most important on the Continent; it is located in many factories in the textile areas and is not highly localized as it is in Scotland.

The production of silk and rayon are important textile industries of recent growth. The silk industry was developed after 1871, especially at Krefeld-Uerdingen and in Baden and Alsace. Between the wars, the manufacturers turned to the production of rayon and staple fibre from synthetic fibre, made from wood-pulp by chemical processes. The latter produces continuous lengths, like cotton and wools, and can be used on textile machinery, so that its production has gone ahead at the expense of rayon. The production of these synthetic textile industries released Germany to some degree from the import of textile fibres, and the production of staple fibre in particular increased spectacularly under the Nazis in the 'thirties and formed over a half of the European production in 1938.

Glass-making, like iron-working, was widespread in the Middle Ages in the uplands near supplies of timber, sands and clays. It began to be attracted to the coal-fields after 1800 and then to the lignite-fields after 1850. Glass production is now highly localized. The chief modern centres are concentrated on the Ruhr, the Saar, and the lignite-fields of Lusatia and Saxony, where the industry can draw at minimum costs the

large supplies of heat, sand and soda ash required in large-scale modern processes. Glass-working is still carried on as a domestic industry in the forested highlands where potash salt derived from charcoal from local timber was originally used. Today these districts produce such small skilled products as jewellery and glass eyes for dolls.

The making of porcelain dates from the end of the eighteenth century when local clays were used by two men in Thuringia, who were encouraged by the ruling prince of the state. In the early nineteenth century two other centres were established in the northeast of Bavaria (Weiden) and in Silesia, and these now produce almost all Germany's output. Dresden and Meissen are reputed for their pottery.

Paper-making was also formerly dependent on local supplies of timber and running water for both processing and power. The chief area in the early nineteenth century was in the Erzgebirge of Saxony on the upper courses of the many upland streams. Pre-war, nearly a half of the timber was imported, most of it from Bohemia, via the river Elbe, and fuel was imported from the coal-field of Zwickau and from the lignite-field to the north. Both water power and steam power are now widely used, and Saxony is still the chief area of paper production, occupying a quarter of the total persons employed in this industry in Germany. Paper-making and the printing industries, apart from Berlin, the chief centre, are also highly concentrated in Leipzig, and to a lesser extent in the other great cities. About a quarter of the domestic wood-pulp output is used for the manufacture of synthetic textiles. The production of paper in the 'thirties reached about 3 million tons.

Leather-tanning was formerly concentrated in the middle Rhinelands, where the main oak forests of Germany are situated. Local hides were also used. Over a half of the hides for the whole industry are imported, and tannin extract is obtained from imported quebracho wood. Consequently, new seats of the leather industry grew at or near the ports, especially in Schleswig-Holstein. Tanneries, however, are still most numerous in the chief cattle-rearing areas in the Reich and here too are the main seats of boot and shoe production. A quarter of the production of the latter is drawn from the Palatinate, where Pirmasens is almost exclusively a boot and shoe manufacturing town, while a fifth of the production is drawn from Württemberg at Kornwestheim. Similar proportions are drawn from Saxony and Bavaria. Other leather goods are produced, especially in the middle Rhine area at Offenbach and in the large cities. Over a half of the leather production is used in the production of boots and shoes.

Miscellaneous Industries of General Distribution. All the industries we have examined so far are tied down to particular areas or cities, although some are more widely distributed than others, and they give special

economic character to the areas in which they are carried on. Many of these are "heavy industries" that are tied down to their raw materials. Others depend on old-established traditions and skills in handicrafts in poor districts, where there are many people without adequate farming resources to support them. This has been the case with the metal-working and textile industries. The latter were stimulated and supported by the rulers in the so-called "mercantilist era" in the highland areas, where there was a poverty-stricken but skilled labour supply that was badly hit by the decline of the metal-working industries. Such textile industries were also started in new areas with the use of running water in small workshops at the end of the eighteenth century by the support of the same rulers within the boundaries of their small states.

A second great group of industries are widely distributed in proportion to the distribution of population. They are concerned, in other words, with satisfying the needs of the *whole* of the population and must have access to them. There are also those industries that depend on materials that are generally, that is universally, distributed and do not therefore call for localization of production in plants in any particular place. Such extractive manufacturing industries are ubiquitous in their distribution. This mode of distribution is characteristic of the clothing industries, that account for a tenth of all the industrial workers, the manufacture of food and drinks, also accounting for a tenth of the total workers, and the building trades, another tenth (actually 12 per cent), and water, gas and electricity supplies. In other words, about one-third of all the industries, based on the numbers of persons they employ, have a distribution that is in the main a replica of the distribution of population. There are, however, some exceptions. The sugar-beet industry is situated in or near the areas of beet production. The large towns in the eastern agricultural area that produce potatoes have the chief distilleries for the making of industrial alcohol, though there are many also in southern Germany. Cigar-making is concentrated in the tobacco-producing district of Baden and the Palatinate. Brewing is particularly concentrated in Bavaria, and above all in Munich, but breweries are also widespread, proportional to the population. Certain industries are located in the ports, where the raw materials are processed before distribution inland. This applies to the processing of cocoa, coffee, rice, tobacco (three-quarters of the consumption being normally imported), flour-milling and the preparation of oils and fats. Over a half of Germany's edible oils and fats are normally imported and the crushing of oil seeds was concentrated at Hamburg, Stettin and Bremen. About two-thirds of these oils were used for making margarine and one-third for soap. The production of the latter is very widely distributed, although main concentrations are to be found at Hamburg and Düsseldorf.

CHAPTER II

COMMERCE AND COMMERCIAL REGIONS

WESTERN CIVILIZATION is based primarily upon the ease, quickness, and cheapness, of the movement of goods, persons, and ideas. The medium of this movement is the route; its nexus, the town. Indeed, a main feature of our Western civilization is the dominance of the great cities in respect of the integration of the life, organization, and activities of large areas around them. Commerce finds its expression in two main ways. First, there is the long-distance movement of goods from one seat of industry to another, from port to market, and from seat of production to the great clearing-house in the metropolitan city. Secondly, there is the regional integration, which is focused upon the great cities in virtue of their vast size and their multitude of functions. It is thus in terms of the long-distance traffic that we shall examine the network of trade of west-central Europe and its subdivision into sections; and in terms of the regional integration of neighbouring agricultural and industrial areas around the great metropolitan cities that we shall seek to determine the modern regions of human life and organization.

HISTORICAL BACKGROUND

We may first glance at certain main traits of the historical development of transport facilities in their effects on the sequence of man-land relationships. The great advance in road and canal construction that took place in France during the eighteenth century, and especially during the Napoleonic era, took place tardily in the politically divided lands of Germany. Roads were bad in the early nineteenth century and the network of roads was still substantially the same as the network that was in being at the end of the Middle Ages, which we have noted on a previous page, and was probably in no better general condition. The metalling of roads had only just begun. The "Army and Trade Roads", as they were called, were, like the King's Highway in England, routes on which travel was permissible, with an occasional bridge or ferry. Under the Napoleonic occupation of the northwestern Rhinelands new straight and metalled roads had been built. Down to the middle of the nineteenth century, however, there were scarcely any metalled roads in the rest of

the Northern Lowland, where there was a dearth of suitable metallurgical material. The great era of road-building in Prussia began in 1845 and lasted until 1870. Little was done in the eastern provinces until 1850. "The late completion of a full road network in Germany is one of the many reasons for the lateness and rapidity of her final industrial development."¹

Throughout the Middle Ages almost all rivers were navigated by small boats. The first canals to be constructed were situated in the narrow stretch of land at the head of the Denmark peninsula. It was here that the townsmen of the great medieval port of Lübeck built a canal at the end of the fourteenth century, called the Stechnitz canal, to carry salt from the Lüneburg district for the salting of herrings in the Baltic ports. This canal, twenty-one kilometres long, ran southwards to join with the lower Elbe. A second canal was built in the same area shortly after 1500 to serve for the transport of general merchandise from the southwest Baltic through Lübeck to Hamburg on the lower Elbe. This was a joint undertaking between the two cities, but difficulties were met in supplying it with adequate quantities of water; the landlords in the intervening territory were also opposed to it, and it soon fell into disuse. The purpose of these canals, of course, was to provide a direct link in the territory of the Reich between the Baltic and northern Germany, so as to avoid the longer sea passage that was controlled by Denmark. The same general incentive, with a definite strategic intent, prompted the construction of the Kaiser Wilhelm or Kiel canal in the same area four centuries later. Canal construction was relatively easy in the Northern Lowland and was undertaken at an early date in Brandenburg so as to link the capital with the Elbe and the Oder. The Finow canal was built in 1620 to connect the Oder and the Havel and other canals in this area were cut early in the nineteenth century before the advent of the railway. But the great era of river improvement and canal construction came in the latter half of the century. The more ambitious projects still further to improve the rivers and to construct new interconnecting canals come later still, in the twentieth century.

The improvement of navigation on the rivers was tardy also, since rivers were divided in their ownership and control. It took sixteen years (1816 to 1831) to regulate the international status of the Rhine and the free movement of goods on the river was not facilitated until after the elimination of tariff boundaries by the formation of the Zollverein. Germany was only slowly freed from the handicaps of a medieval fiscal system that imposed numerous artificial barriers on the free flow of goods by water and were at least as harmful as the rocks and shallows that had to be cleared to enable the free movement of ever larger vessels. In 1800 tolls

¹ J. H. Clapham, *Economic Development of France and Germany, 1815-1914*, p. 350.

were paid fourteen times on the Elbe between Hamburg and Magdeburg and thirty-three times on the Maine between Bamberg and Mainz.

Canal construction was neglected during the great railway-building boom, but began to receive renewed attention, largely for strategic reasons, in the 'eighties. These included the Kaiser Wilhelm or the Kiel canal and the Dortmund-Ems canal. The first was opened in 1901, though it was not entirely completed until 1914. The second was built between 1887 and 1895. In 1914 the canals of Germany reached 2,600 km. in length as compared to 5,000 km. in France, although Germany had about twice as many canalized or improved rivers as France. Tremendous strides were made after 1870 in the improvement of the rivers. This was the era of *Strombau*. In 1877 cargoes of 800 tons and in 1905 2,000 tons could navigate the Rhine to Mannheim. In 1877 cargoes of 400 to 500 tons could navigate the Elbe upstream to Magdeburg, in 1905 1,300 tons. In 1905 cargoes of 900 tons could navigate the Dortmund-Ems canal. The average canal barge reaching Berlin in 1878 carried 70 tons whereas in 1905 it was 190 tons.

The railway era began in the 'thirties. The first line was opened in 1839 between Leipzig and Dresden. Its first passengers, as Clapham reports, included ladies who kept needles between their lips to check familiarity in the single tunnel. In 1849-50 there were 3,000 miles of tracks on the German territory of 1914 as compared with 2,000 miles in France. Blocked out in 1850, the railway net, in all its essentials, was completed by 1870. The 6,000 km. (on the 1871 area) in 1850 reached 20,000 in 1871, 43,000 in 1890, and 61,000 in 1910. "In a country whose railway system was still new and very imperfect, and whose towns were almost without exception small and half rural, its revolutionary influence was far more conspicuous than in older-developed and more urbanized lands. There was something American about it, just as there was a technical likeness between German and American railway methods"¹

The advent of the railway and the telephone and the rapidly increasing complexity of social and economic life brought great changes in rural and urban life. A few points may be noticed.

Even the trader with a shop was not too common in the Germany of the 'forties. In most places there were no shops except the workshops of the handicraftsmen, tailors, cobblers, carpenters and the rest. If the consumer wanted what they could not make, he must buy from a peddler or from his local yearly market. Townsmen and peasant met weekly at the ordinary market, to buy and sell food; and so the average town lived on local produce. Few were large enough to need supplies from a distance. But for anything unusual both townsman and peasant had to wait. Spices and condiments, materials for clothes, furniture, tools and implements at all out of the common run, toys and little luxuries, were brought by migratory traders—grading upwards from the peddler to what might

¹ *Ibid.*, p. 155.

be called the merchant—to the yearly market. It was a great occasion. There were puppet shows and rope-dancers and English riders. The peasants poured in to make their little purchases; the squires and townsfolk laid in their stores. There would be selling, too, by the local people—cattle perhaps, if the yearly market was also a cattle market, or flax and other industrial crops, if the district grew a surplus of these things.¹

The great fairs began to show signs of decline in the middle of the century. Here met dealers rather than consumers. "The local trader, who collected from independent craftsmen or peasants the coffee mills of Nuremberg, the clocks of the Black Forest, the linens of Silesia, or the toys of the Thüringerwald, met at the fairs other traders who knew the outlets for his goods, at home or abroad." The large *Verleger*, for whom cottage wage-earners worked on commission, might visit the fair for himself. The importers of "colonial wares" reached their widespread clientele through the medium of the fairs, but since these were in general demand they early began to be sold in regular shops, though the change was slow. Before the Napoleonic wars, Berlin, with its court and 200,000 inhabitants, had a very few shops clustered on two streets. The Berliners spun, baked and brewed and sometimes even wove and slaughtered at home at this time.² And this had not changed in 1815 after twenty years of unrest and devastation. It was not until after 1830 that specialized shops began to appear, dealing in sugar and coffee, candles, pins and tape, as successors to the peddler and the weekly market.

In 1871 most German towns had a food market where producer and consumer met and bargained, and in 1910 it was reported that in most small country towns in many regions selling was for the most part done by the producer himself.³ But large central public markets gradually came into being in the larger towns in the second half of the century. Frankfurt was the first city to build a large central market hall on the pattern of the French *Halles* in 1879, and it was followed by many others. These markets sometimes combined retail and wholesale trades. The yearly markets had given way to the shops by 1840 in the large cities. They retained their significance in the smaller towns, but rapidly disappeared after the advent of the railways in the 'seventies. The big international fairs were gradually displaced by the sample fair. The great fair at Leipzig, for example, handled goods such as pottery and glass, metal goods, fancy goods, hardware and toys, leather and furs; and sample trading was applied to the new industries, such as the bicycle and the automobile when they appeared.

This change in the structure of trade and its effects on the commercial character of the town is evident also in the development of transport

¹ *Ibid.*, p. 117.

² *Ibid.*, p. 118.

³ *Ibid.*, p. 369.

facilities (railway passenger station, goods and marshalling yards); industry (new factories tending to cluster first in the built-up area on flat low-lying lands, but later shifting to the outskirts); and in the increasing competition of commerce, administration and recreation for space in the centre of the town. All this specialization of function demanded new building structures and increased the general tempo of social and economic and demographic change in the urban community. The remarkable fact is that this transformation from what were, in effect, medieval conditions to the conditions of contemporary society, was effected in one generation, the Imperial Era of Germany, from 1870 to 1918.

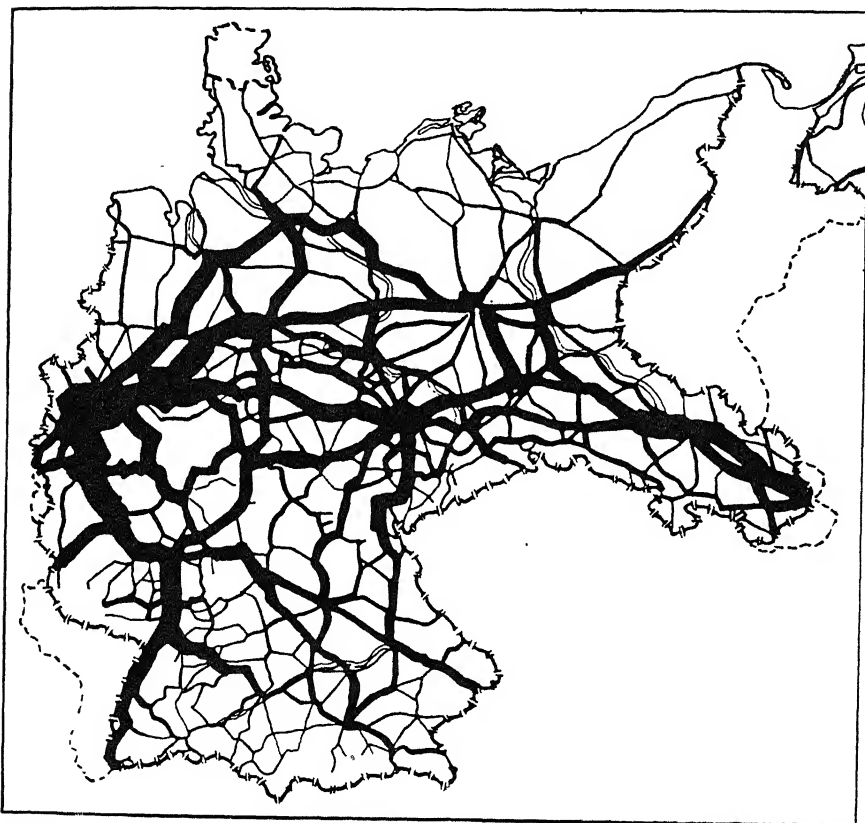


FIG. 38—GERMANY: RAILWAY GOODS TRAFFIC (pre-war) (from Pfannschmidt)
(scale, 1 : 10 m.)

Lines are proportioned in width to daily number of through trains.

THE TRAFFIC ARTERIES

Railways. The railways of pre-war Germany had an aggregate length of nearly 34,000 miles with a density of 18.6 miles of rail for every 100

square miles of territory and 5.6 miles for every 10,000 people. This density, which is the same as that of Denmark, is the highest in Europe, except for Belgium, and is comparable with that of the United Kingdom, which, with 20,700 miles of railways, has 21.5 miles for every 100 square miles and 4.4 miles for every 10,000 inhabitants. The first line was opened in 1835 between Nuremberg and Furth and the first engine was built by Robert Stephenson and had a British crew. The second was built from Leipzig to Dresden in 1839.

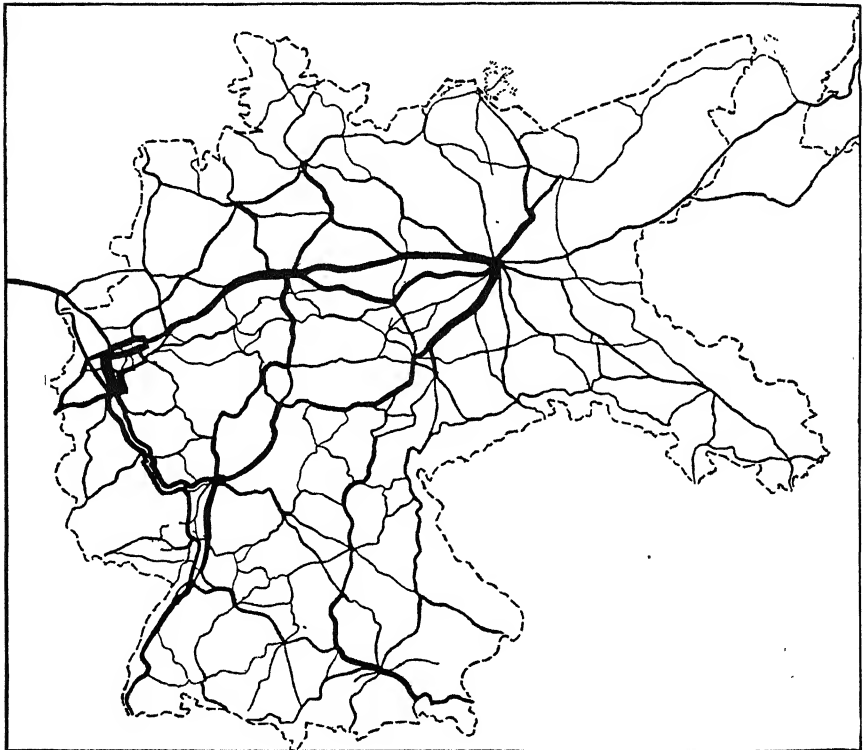


FIG. 39—GERMANY: RAILWAY PASSENGER TRAFFIC (pre-war) (*from Pfannschmidt*) (scale, 1 : 10 m.)

Lines are proportionate in width to the number of daily fast trains.

In 1937, the railways carried about 500 million tons of freight, three times that of the waterways. About two-thirds of the tonnage of this traffic is fuel and ores. The chief items are coal, stone, earth, sand and gravel, lignite, briquettes, lignite coke, and raw lignite. Thus, fuels account for two-fifths of the total. For purposes of traffic statistics by

rail the Reich was divided into forty-three districts (*Verkehrsbezirke*). The Ruhr area alone, comprising two districts, accounted for 18 per cent of this grand traffic total. Of the total, about 90 per cent is classed as domestic traffic (*Inlandverkehr*), while the rest is classed as transit traffic (*Durchgangsverkehr*). Local trade is also distinguished in the domestic total and this consists of consignments to destinations within one traffic district. Coal, the chief item of traffic, is carried by rail rather than water, 100 as against 43 million tons.¹ The patterns of passenger and freight traffic are shown on Figs. 38 and 39.

Roads. Roads carried 15 million tons of traffic over distances of over thirty miles in 1937. A large part of the road traffic, carried over short hauls, is omitted from these aggregate returns. Over a half of this total consisted of industrial products (not minerals), and agricultural products accounted for a third. Roads carried about 550 million passengers in buses on long- and short-distance routes as compared with 1,735 million passengers on rail and 3,000 million by street cars.

The construction of great trans-country motor roads (*Autobahnen*) was a spectacular development in the 'thirties.

Waterways (Fig. 40) play an important part in the commerce of Germany.² There are 8,000 miles of navigable waterways and just over a half take barges with a capacity of over 1,000 tons. In 1937 these navigable waterways carried 133 million tons of goods. The waterways of Germany suffered in the past from numerous tolls levied by independent political authorities more or less at will. The Congress of Vienna recognized the freedom of the navigation of each river throughout its whole length for the states that bordered it, and tolls on the German rivers were generally reduced during the 'fifties and 'sixties. After 1875 canals and rivers were improved and the share of their total traffic increased from 21 per cent in 1875 to 25 per cent in 1910, and the traffic carried increased six-fold. The main deterrent to navigation is the winter freeze. This is only a few days on the Rhine, but lasts two weeks on the Rhine-Herne canal, three or four weeks on the Weser, Main and Danube, four to six weeks on the Mitelland canal, six to eight weeks on the Spree and Oder, and three and a half to four months in East Prussia.

¹ Annual data for the study of traffic movements appear in *Die Güterbewegung auf Deutschen Eisenbahnen im Jahre 1937*, Heft I. *Versand im Inlandverkehr und Versand und Empfang im Auslandsverkehr nach Verkehrsbezirken; Eisenbahn-Umschlagverkehr der Deutschen und Fremden Seehäfen*, *Statistik des Deutschen Reichs*, Band 522, Heft I, Berlin, 1938. Heft II, *Empfang im Inlandverkehr nach Verkehrsbezirken, Durchgangsverkehr, Hauptzusammenstellung, Statistik des Deutschen Reichs*, Band 522, Heft II. There are forty-three such districts in the Reich. The following ports are listed as separate districts, so that their hinterlands may be determined in detail: Königsberg, Pillau and Elbing; Rostock to Flensburg; lower Elbe ports; lower Weser ports; Ems ports. The following cities are also listed separately: Breslau, Berlin, Leipzig, Frankfurt, Cologne, Mannheim-Ludwigshafen, Munich. Twenty-six areas in Europe are also listed.

² *Statistik des Deutschen Reiches*, Band 523, *Die Binnenschifffahrt im Jahre 1937*, 1938.

Of the 133 million tons carried by water in 1937, heavy bulk goods were dominant, the chief being coal and coke (48 millions), lignite (3·3), ores (19·0), sand and gravel (14·0), cereals (6·0), iron and steel (5·0) and stone (4·2). Imports by water reached 26 million tons and of this total 17 went to the Ruhr, including 8 million to Duisburg alone. Over 10 million tons were ores from the Netherlands and 2 million from Belgium. Exports by water were 35 million tons, and of this total 30 million tons went from the lower Rhineland and 17 million from Duisburg alone (25·5 million tons of coal and coke). Most of this moved to the Netherlands, and 6 million tons of coal went to Belgium.

The Rhine has a total navigable length of 443 miles from the Swiss to the Netherlands frontier. The period of navigation between Basel and Strasbourg is just under three months (June to August), this being the period of high water. The strong current also makes upstream navigation difficult in this stretch. The limit for small ocean-going craft is Cologne. Barge trains carrying 6-7,000 tons reach Duisburg, barge trains of 5,000 tons reach Mannheim, and barges of 1-2,000 tons reach as far as Strasbourg. The channel to Basel has been straightened and banked, though an increased velocity of flow is the result. The last barrage is at Kembs. Duisburg-Ruhrort dominates the traffic, and handled 34 million tons of goods in 1937. There are smaller industrial wharves on the lower Rhine at Ürdingen, Düsseldorf-Neuss (3·9 million tons), and Cologne (3·4), with Wesseling (the outlet for the lignite-field) (3). Mainz handles 2·5 million tons, Mannheim-Ludwigshafen 11 million tons (coal, iron and steel, chemicals and petroleum), and Karlsruhe (3).

The Rhine traffic amounts to two-thirds of the total water-borne traffic of Germany and consists of coal, iron ore, cereals and timber. In 1937 25·7 million tons moved upstream across the Netherlands frontier and included 13 million tons of iron ore and 2·8 million tons of grain. The downstream traffic amounted to 33 million tons, including 23·7 million tons of coal, coke and lignite briquettes, 2 million tons of iron and steel goods, and 1·5 million tons of fertilizers.

The river Main is navigable up to Bamberg and the Danube is navigable below Kelheim. A canal to connect them, that roughly follows the direction of the Ludwigs canal, is under construction. The Neckar is navigable for 1,000-ton barges to Plochingen, and a canal via Stuttgart to link it with the Danube at Ulm is under construction.

The Weser is navigable for 850-ton barges to Hameln and, through recent dredging, up to Kassel, whence 400-ton barges can reach Meiningen on the Werra. The Mittelland canal takes 1,000-ton barges, and Hildesheim, Hanover and Brunswick have dock facilities on it. The canal is now complete from the Ems canal to the Elbe at Burg, a little below Magdeburg.

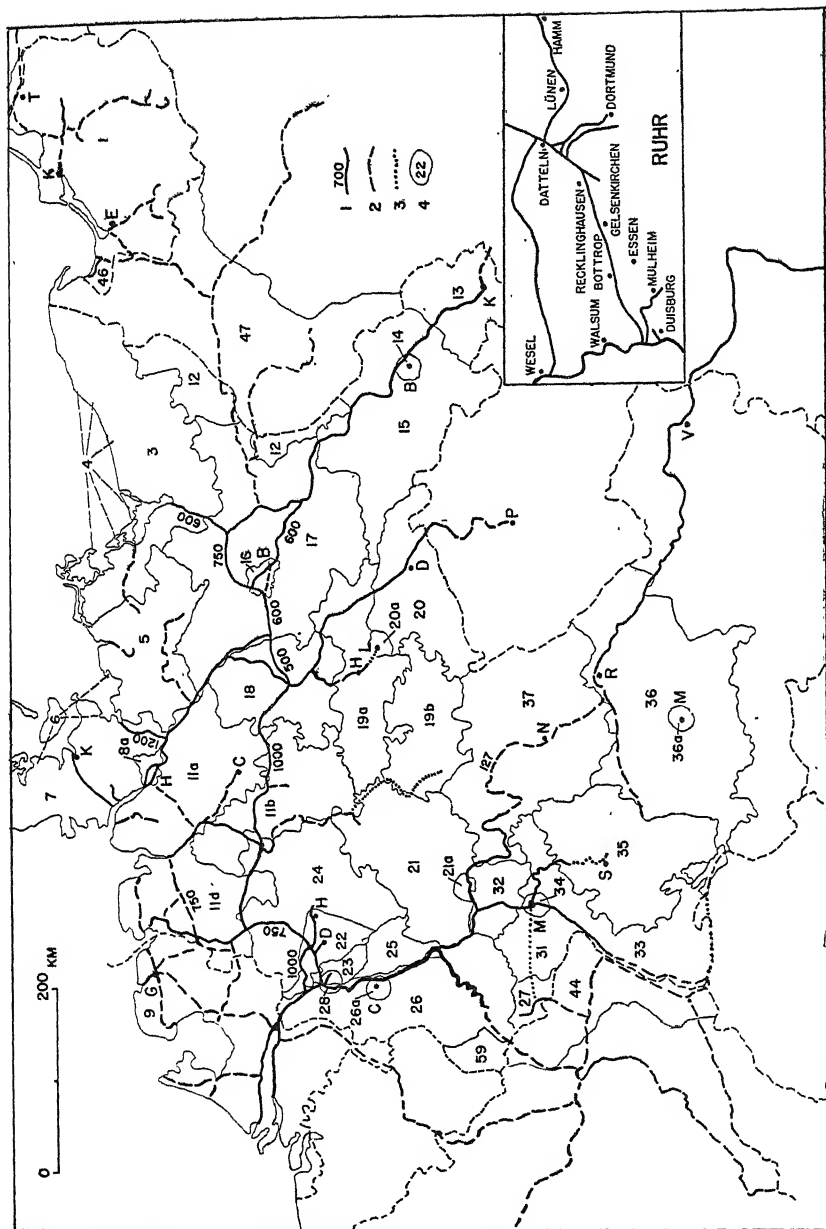


FIG. 40—GERMANY: NAVIGABLE WATERWAYS (scale, 1 : 8 m.)

1. Navigable rivers and canals; numbers indicate tonnage capacity of barges 2. Minor waterways 3. Canals projected
4. Trade districts with their numbers (detailed reference to these districts is omitted in the text).

The Elbe is the second great navigable artery of Germany, but its traffic differs considerably from that of the Rhine in the much greater diversity of its products that move both upstream and downstream. It is navigable by 600-ton barges as far as Prague. Hamburg is the terminus of most of this traffic. In 1938 Hamburg handled 10 million tons of coal, coke, petroleum, wheat, timber, wood-pulp, iron ore, fertilizers and food-stuffs. In 1938 the section of the river from Hamburg to Lauenberg (31 miles) handled 8.8 million tons, the middle Elbe upstream to Wallnitzhafen (192 miles) handled 6 million tons, and the upper Elbe to the Czech frontier handled 850,000 tons, while the Czech sector handled 1 million tons. Magdeburg (2.1 millions), Dessau (Wallnitzhafen, 385,000 tons), Dresden (642,000 tons), Aussig and Prague are the chief ports.

The Saale and the Unstrut below Artern are navigable for 200-ton barges, though the Saale below Halle is navigable by 500-ton barges, and upstream Naumburg is the limit of navigation (170-ton barges). The Saale is being deepened and straightened for 1,000-ton barges. The Oder has an unfavourable regime for navigation, since it has very low water in summer and serious floods in spring and ice also occurs for forty days at Frankfurt. Kosel has long been the head of navigation, but in 1940 the Adolf Hitler canal was opened to link the Oder at Kosel with Upper Silesia at Gleiwitz. Coal and coke are the chief items of the traffic on the upper Oder.

THE PORTS (See also Ch. 20)

The overseas trade of Germany is handled by the ports on the North Sea and the Baltic Sea shores. Hamburg is the giant of this traffic, handling well over a half of the total. Bremen handles about one-tenth of the total, and Emden 6 per cent. Thus, the North Sea ports handle two-thirds of the overseas trade passing through German ports. The Baltic ports are more numerous and were of great importance in the Middle Ages, when Lübeck was their leader. These ports have steadily increased their trade, but the proportion to the total has decreased through the growth of the North Sea ports. It was not until 1860 that the tonnage of ships using the two groups of ports reached equality. In the aggregate they handled one-third of the overseas trade, and this was mainly directed to northern Europe. The chief of the German Baltic ports was Stettin.

During the first half of the nineteenth century the ports at the mouth of the Rhine—Rotterdam, Antwerp and Amsterdam—were able to take immediate advantage of the growing needs of the industrial areas of the Rhinelands, particularly of the Ruhr. The development was facilitated

by the dues levied on the Scheldt by Holland on Belgium from 1830 to 1863, that worked to the disadvantage of Antwerp. Antwerp developed, unlike Rotterdam, as a liner port after 1850, handling large quantities of goods that are carried by rail in numerous, relatively small, consignments. Hamburg rather resembles Rotterdam in the great volume of its traffic that is transhipped from boat to barge. This is evident in the large extent of its water areas as opposed to the large railway tracks of Antwerp and Bremen. Hamburg handled about 10 million tons of river-borne traffic in 1930, as compared with 29 for Duisburg-Ruhrort, 8.7 for Berlin and 8.5 for Mannheim-Ludwigshafen.

The growth of both Hamburg and Bremen dates especially from 1870, with the ever-growing demands of a rapidly growing industrial hinterland on overseas markets for foods, raw materials and manufactured goods that are carried by rail in numerous, relatively small, consignments. This formed the basis of the liner traffic of both Hapag and Lloyd. The vast shipping concerns catered for emigrants not merely from Germany but also from the whole of central and eastern Europe. In the first years of the twentieth century when this emigration reached its peak, these two firms handled more than a third of all the immigrants who entered the United States through New York. In 1912, 120,000 persons passed through Hamburg, and 133,000 through Bremen. Further advantages that accrued to these two ports were the special railway freight rates in Germany and through rates for Baltic goods that came through the Kiel canal. In this way the two German ports were able to compete with the Rhine ports. The situation may be judged by the tonnage of ships entering the ports. This is shown below:

Shipping Tonnage entering the Ports (in millions of net registered tons)

	1870	1913	1927	1932
Hamburg ..	1.65	14.2	19.6	18.25
Bremen* ..	0.5	5.3	8.7	7.9
Rotterdam ..	1.2	12.8	21.2	14.2
Antwerp ..	1.4	12.0	19.9	16.7

*Bremen includes Bremerhaven.

A registered ton is a measurement of space. It amounts to 2.83 cubic metres. A net registered ton is the cubic space minus the space *not* available for cargo.

Hamburg has a large number of independent liner companies with regular sailings to all parts of the world, far more so than Bremen. Moreover its trade is very widely distributed through the world, as opposed to that of Bremen which is more exclusively concerned with the North American trade. Two-thirds of the ingoing ships and four-tenths of the outgoing ships to and from Bremen go to North America,

the corresponding figures for Hamburg, in and out, being one-third. Hamburg had a much larger number of independent firms handling its commerce than Bremen, although many of these firms were merged in the post-1918 period. The biggest of these is the Hamburg-Amerika line, that began in 1847 with the sailing ship and soon exceeded the Lloyd firm of Bremen that was a little older. The former continued to handle much of the passenger traffic, handling 160,000 passengers in 1930. A number of old-established Hamburg lines were absorbed by the Hamburg-Amerika lines after World War I. Immediately after World War I, the German flag was insignificant in the sailing to and from Hamburg, but foreign lines all sought to have a place in its traffic. But in the 'thirties the German proportion again held first place, these German firms competing hard with the foreign firms that had regular sailings from Hamburg. The tonnage of Hamburg shipping lines was 2.2 million registered tons in the early 'thirties as compared with 4.2 million for the Reich and 1.4 million for Bremen. Hamburg's trade was so widespread and varied that consignments were sent out at first in foreign vessels and the Hamburg firms slowly took over a larger proportion. Bremen's trade was smaller and its firms sought to increase this trade by building its own ships. Thus, in 1850 Bremen was the chief shipping port, while Hamburg was about equal with Stettin, Danzig and Rostock. Not till 1873 did Hamburg finally take the lead in its own shipping tonnage.

Industry and commerce have grown at Hamburg with the growth of overseas trade. Shipbuilding and marine engineering, in which the firms of Blohm and Voss, the Deutsche Werft and Howaldswerke are the chief participants, are clustered in the harbour area. The treatment of imported raw materials and foodstuffs has also developed both in the harbour area as well as on the wider urban periphery. Oil, grain, wool and jute spinning, rubber and chemicals, asphalt, margarine, cigarettes and cigars, are included in these industries. This industry has been supported in large measure by the import of cheap English coal, that was able to compete with Ruhr coal.

Bremen's contacts with its hinterland are almost entirely by rail. Eighty-five per cent of the goods received come by rail or road, only 15 per cent by water, as compared with 40 per cent by rail and 60 per cent by water to Hamburg. Thus, the railway track alongside the wharves and warehouses are main features of Bremen. It has 300 km. of rail to 40 km. of wharves. It also has industries associated with its trades and shipbuilding as in Hamburg. But after 1918 it concentrated again on the development of passenger services and to this end built the *Bremen* and the *Europa* and the *Columbus* especially for trade with New York. The traffic of Bremen consists chiefly of cotton, wool and grain. It is the

principal cotton market on the Continent. Of lesser importance are yarns, skins, metals, oil seeds, tobacco and coffee. Exports make up only a third of the value of its imports. And throughout its modern development the trade of Bremen has been overwhelmingly concentrated on the United States.

Extra-European Trade of Bremen and Hamburg by Continents (1929)

	<i>Imports</i>		<i>Exports</i>	
	<i>B.</i>	<i>H.</i>	<i>B.</i>	<i>H.</i>
North America ..	67	33	42	32
South America ..	8	22	8	13
South Asia ..	13	16	18	12
East Asia	1	17	10	21
Africa	5	8	4	10

Goods Traffic of German Ports in 1928-38 (in thousands of tons)
(*Statistisches Handbuch*, 1949, p. 367, and *Deutschland Jahrbuch*, 1949, p. 197)

	<i>Exports</i>			<i>Imports</i>		
	1928	1938	1947	1928	1938	1947
Stettin ..	825	2,169	—	2,750	3,348	—
Hamburg ..	8,877	5,644	982	19,036	16,878	5,013
Bremen ..	1,624	4,069	273	3,564	3,225	4,570
Emden ..	349	1,105	316	1,442	3,905	2,515

Inland Traffic of Hamburg (in thousands of tons)
(*Deutschland Jahrbuch*, 1949, p. 197.)

	1938	1946
Lower Elbe ..	872	545
Upper Elbe ..	8,989	758
British Zone ..	854	476
Soviet Zone ..	7,214	227
Czechoslovakia ..	902	259
TOTAL ..	18,831	2,265

While the North Sea coast contains two main ports and a third of minor importance, the Baltic coast contains a large number of ports of historic importance, only a few of which are of significance in modern commerce. In 1869 Stettin slightly exceeded Bremen in terms of its ingoing shipping tonnage. Schleswig is the oldest of the German Baltic

ports since it dates from the tenth century. Lübeck and Danzig emerged early in the eleventh century but did not become important ports until after the German settlement in the twelfth century. About the same period Flensburg emerged. During the thirteenth century the remainder developed—Kiel, Wismar, Rostock, Stralsund, Stettin, Stolp, Elbing, Königsberg, Memel. These ports were activated largely by the members of the Hanseatic League, and their development was associated partly with the eastward spread of German colonization, and partly by the development of trade with the Scandinavian countries, from whence was derived timber, tar, wax, honey, furs and fish. The southwestern Baltic also had great herring shoals, but these shifted at the end of the Middle Ages to the North Sea, for reasons that are obscure. Wheat became an important export of the Vistula basin and the western Ukraine in the seventeenth and eighteenth centuries, and it was exported through the great port of Danzig, until the partition of Poland cut it off from its natural hinterland. In the fifteenth century Holland, that was primarily a commercial and industrial state, derived nine-tenths of its wheat requirement from the Baltic lands. This importance of the Baltic as a source of timber and grain remained until the nineteenth century. This trade was the *raison d'être* of the Baltic ports until the early nineteenth century.

The industrialization of western Europe and the growth of transatlantic trade changed the picture. The industrial areas of Germany were the chief centres of attraction for both the import and export of goods through the North Sea ports. Moreover, the grain surpluses of eastern and central Europe beyond the Elbe on the whole decreased with the increase of their own consumption. New commodities, however, entered into the trade of the Baltic in this modern period. The chief of these are timber and iron ore, both of which move south, and coal, that moves north to feed the countries of Scandinavia and the Baltic shores, none of which possess coal. But the change-over in the total traffic of the North Sea and the Baltic ports was slow. For in spite of the rapidly growing demands for shipping facilities in western Europe, the ports of Bremen and Hamburg had to recover from the devastation and bad times of the Napoleonic wars; moreover, they had to compete with the ports of the Low Countries as well as with the British ports. So that the Baltic ports were, in fact, only slowly eclipsed. Thus, in 1850, ship entrances were as follows:

Ship Entrances, 1850 (in thousands of registered tons)

Hamburg	..	546	Bremen	..	..	123	Kiel	..	..	38
Stettin	..	207	Lubeck	..	..	106	Wismar	..	..	30
Danzig	..	184	Altona	..	..	76	Stralsund	..	..	30
Memel	..	160	Rostock	..	..	48	Emden	..	..	28
Königsberg	..	127	Brake	..	..	45				

Moreover, the custom of several persons investing in one vessel helped to maintain many small ports down to the 'eighties. Thus, in 1850 the shipping entries in aggregate to the Baltic ports were 1,500,000 tons as compared with 1,100,000 tons to the North Sea ports. In 1930 the totals were 9,700,000 tons and 34,100,000 tons respectively. The decline of these ports is thus relative to the tremendous increase of Hamburg and Bremen. In 1850 only Hamburg came in question, for in this year Bremen was exceeded by four Baltic ports. Only in 1860 was equality reached, and after 1870 the North Sea trade increased rapidly. But this does not mean an actual decrease in the amount of Baltic trade. On the contrary, this trade increased. The total tonnage of ships entering the Baltic Sea ports increased from 1.5 million in 1850 to 10.9 million in 1913, whereas that of the North Sea ports increased from 1.1 million to 24.1 million in the same period. (It should be noted that Danzig is included in these figures.) During World War I, the trade of the North Sea ports came to a standstill, but that of the Baltic ports continued and increased. The same was true of World War II. Various attempts have also been made to increase the trade of the Baltic by the opening of the canal from Leningrad to the White Sea and to make Copenhagen into an *entrepôt* for the Baltic trade.¹

The ports suffered great damage during the war, but by 1947 40 per cent of Hamburg's pre-war capacity was available, 45 per cent of Bremen's, and 85 per cent of Emden's. The total goods traffic of these three ports was 15 million tons in 1947 (as compared with 50 millions in 1938), 6 million tons to Hamburg, 3.9 to Bremen, 4.8 to Bremerhaven. The inland trade of Hamburg suffers from the fact that the hinterland lies in the Russian Zone. The 10 million tons of inland river traffic in 1938 was reduced to 1.3 million tons in 1946. The trade with the Soviet section of the hinterland has vanished. Czechoslovakia is finding its overseas outlets in Stettin and Rotterdam. The transit trade through Hamburg was reduced in 1947 to 28 per cent of its pre-war level. Bremen, on the other hand, shows a better revival, since it is the port for the American Zone, and Bremerhaven in particular is used for this traffic.

SOME MAJOR COMMODITY MOVEMENTS

Some of the basic facts of production, commerce, and organization will now be briefly summarized. A wide industrial zone extends from the western frontier at Aachen to a broad base along the upland frontier zone against Czechoslovakia. It lies on the northern edge of, and extends into, the *Mittelgebirge*. The most exclusively industrial areas are the Ruhr and the basin of the middle Elbe (Central Germany). The Rhineland is

¹ This material is drawn from R. Lütgens, *Die Deutschen Seehäfen*, 1934.

the second industrial zone. The chief area here is the northern part of the Upper Rhine Plain; its main centres are Frankfurt and Mannheim. The Neckar basin is the nucleus of another major industrial region in the southwest. Elsewhere the great cities are the chief industrial centres, the largest of which is, of course, Berlin. These facts are shown in Figs. 39-49. Let us first consider the normal pre-war movements of foodstuffs.

The agricultural regions of west-central Europe have already been discussed in general. Large holdings predominate east of the Elbe and in an extension westward that includes the loess soils of the *Börde* between the Elbe and the Weser. Here are the two main regions of rye-potato-livestock production, in the north and northeast, and the belt of wheat-beet-livestock production, on the edge of the Central Uplands. A low ratio of population to cultivated area permits a surplus of grain, potatoes and stock, which was directed mainly to Berlin and Saxony; rye was normally exported in considerable quantities to Scandinavia. Medium-sized holdings predominate in the northwest and in Bavaria. The northwest has a large production and surplus of potatoes, dairy products, beef and swine. Bavaria, north of the Danube, is characterized by livestock and crop production, in contrast with the dairying production (and surplus) of the Bavarian Plateau and the Neckar basin. Small-holdings (less than 12½ acres) predominate in the Rhine land, and the farmer sells mainly small quantities of wine, fruits, tobacco, etc. Throughout the south and west farmers live on small, subdivided farms, and the domestic demand absorbs the bulk of the production. Here, however, there are large industrial areas—the Ruhr, the middle Rhine, Württemberg, Baden and Munich. Consequently all of this half of Germany is on balance an importer of certain food supplies—grain, potatoes, swine. The chief consumer is the overwhelmingly urbanized region of the lower Rhinelands. The principal sources of supplies are the *Börde* and the northwest. The west is too remote to draw normally on the surpluses of the east; in any case, the main grain there is rye, and food surpluses are absorbed by Berlin and Saxony. Thus, through the medium of the Rhine, large quantities of wheat are imported from abroad.

The concentration of people in urban areas necessitates the importation of food supplies from extensive home areas and perhaps from abroad. The specialization of modern industrial production entails a dependence on distant home markets, nation-wide relationships with regions of complementary character, and a dependence on ports for foreign trade. This highly complex fabric of interregional relationships can be illustrated here by only a few examples, based on goods-traffic returns (water- and rail-borne) for the year 1937.¹ The regions that import the largest quantities of grain are Saxony and the lower Rhine

¹ *Die Güterbewegung auf den Deutschen Eisenbahnen im Jahre 1937.* (See p. 257).

and the densely populated areas of Württemberg and Baden. Even Bavaria is on balance an importer, mainly on account of the large demands of its two chief cities, Nuremberg and Munich (Fig. 41). The main centres of grain distribution are indicated by the location of the milling industry. The large centres of Hamburg and Bremen depend on imported foreign supplies; Berlin depends largely on the east Elbian

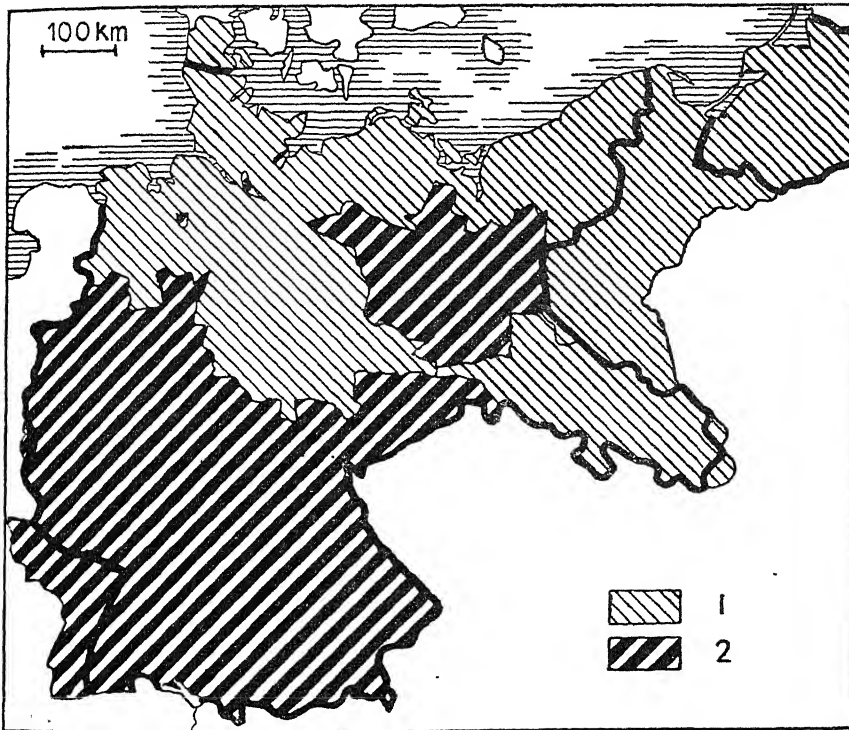


FIG. 41—GERMANY: DISTRIBUTION OF BREAD GRAINS (pre-war)
(from Scheu) (scale, 1 : 10 m.)

This map shows the areas with surplus supplies for export (1) and areas with a deficiency, that depend on imports to meet total consumption requirements (2).

region. The chief milling regions of the Rhineland, also depending mainly on foreign supplies, brought up the Rhine, are the lower Rhine area, which supplies the urban areas of the northwest, and the Mannheim district, which is the chief supplier of the southwest. The other important areas of concentration are the two rich agricultural areas of Central Germany and Silesia.

It is often stated in post-war reports that the western section of Germany would be much better-fed if the surpluses of eastern Germany,

now occupied by Russia and Poland, were available. The assumption is that formerly the agricultural provinces of the east supplied large quantities of foodstuffs to the western provinces. In fact, the surpluses of grain and meat and livestock of the eastern provinces went almost entirely to Berlin, Saxony and Thuringia. The supplies imported by the Ruhr and the rest of the provinces of Rhineland and Westphalia from the eastern provinces beyond the Elbe in 1937 were small. This applies to wheat, rye, meat and livestock. The only really substantial contributions from these eastern provinces to western Germany were potatoes. Out of a total import of about 800,000 tons of potatoes to the Ruhr in 1937 roughly 350,000 tons, or nearly a half, was drawn from these eastern districts. The eastern provinces supplied the Elbe basin areas and Berlin, not northwestern Germany. The latter—and this means the British Zone of occupation—depended on the western provinces, and especially on imports.¹

These pre-war figures indicate the dependence of the western provinces partly on local movements, notably from the surplus areas of the Cologne Bay, the *Börde*, and south Bavaria, but also on wheat imports through Hamburg, Duisburg and Mannheim. There was a negligible movement from the eastern provinces. Post-war implications are considered in Chapter 51.

As regards meat supplies (Fig. 42) the slaughter-houses of the lower Rhine urban centres obtain the bulk of their cattle, calves and swine from Westphalia, Hanover and Oldenburg. Practically all the Ruhr's supply of swine comes from this same area. Berlin's meat supplies come mainly from Pomerania and East Prussia. Saxony, with its five million people, imports pigs (in spite of its own large production) from Schleswig-Holstein and, to a less extent, from province Saxony, Lower Silesia and Thuringia; cattle are obtained mainly from the contiguous areas.

The movement of raw materials and manufactured goods shows a much more complicated pattern. The principal coal-fields of Germany are near its frontiers, a location favourable for export, but disadvantageous for general distribution at competitive prices. Between the wars, Upper Silesia supplied the area east of the Elbe, except in its lower reaches, and the Ruhr served mainly the northwest. Large quantities of coal were sent to central Germany and to south Germany, and large quantities of coke to the Saar. Coal from the Saar was sent to the south, where it competed with Ruhr supplies (see below). Through the ports came English coal, some 10 million tons annually, into the area between the

¹ South Bavaria is a large surplus area for western Germany. Its exports of wheat in 1937 reached 200,000 tons of which 35,000 tons went to the Ruhr and 40,000 tons to Mannheim and 20,000 tons to Munich. Exports of rye reach 20,000 tons (4,500 tons to Munich and 6,000 tons to North Bavaria and 3,000 tons to Frankfurt). Rye and wheat flour exports reach 43,000 tons, over a half of which goes to North Bavaria and Munich.

two competitive sources of coal supply; the three supplies met and competed in Berlin. It is in this intermediate area that the phenomenal development of brown coal (lignite) production has taken place, during and since the 1914-18 war (Fig. 43). Brown coal, used as a fuel or converted into briquettes, has a limited marketing radius. The bulk of the production of the plains of Central Germany is used on the spot in the

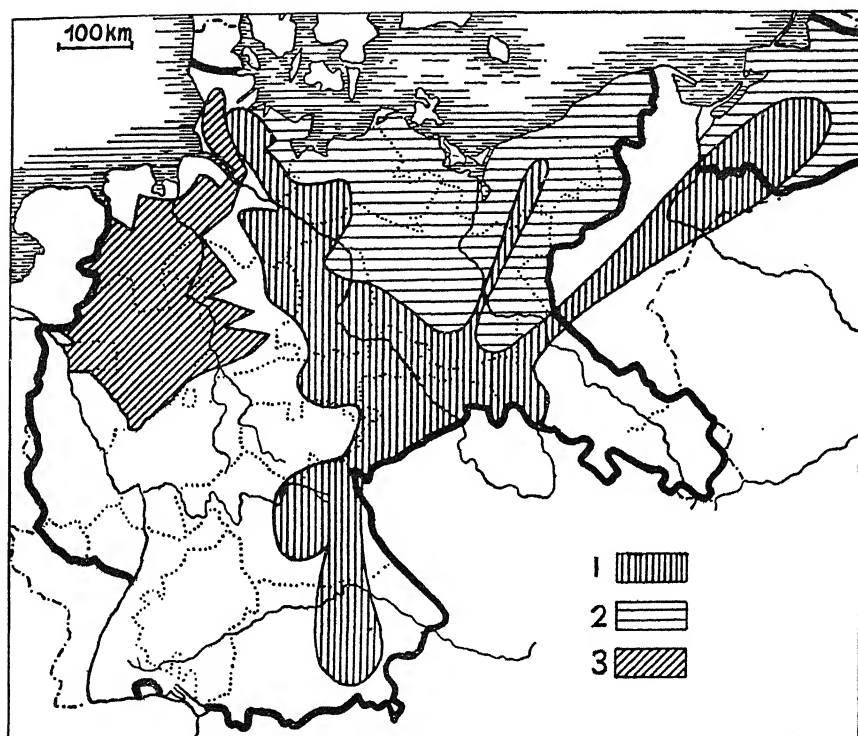


FIG. 42—GERMANY: MEAT SUPPLIES OF THE CHIEF CITIES (pre-war)
(from Scheu) (scale, 1 : 10 m.)

Areas of meat supply of the three chief areas of consumption (pre-war):

- | | | |
|-----------|-----------|---------|
| 1. Saxony | 2. Berlin | 3. Ruhr |
|-----------|-----------|---------|

sugar-beet and chemical industries and for the generation of electricity, which is distributed throughout this vast industrial region. The trade in brown coal is directed mainly to the complementary industrial region of Saxony. A similar development and export of brown coal to complementary and neighbouring industrial areas—in this case the areas of the lower Rhine—is found in the other main area of production, in the “bay” of the Cologne lowland, west of the city of Cologne. It may be added that the main marketing areas of the chief producers of iron and

steel coincide, in general, with the coal areas, since the main centres of production of both products are the same.

Attention should also be given to the seats of production of iron and steel, and the extent of the pre-war market areas of the four main seats of production (Fig. 44).

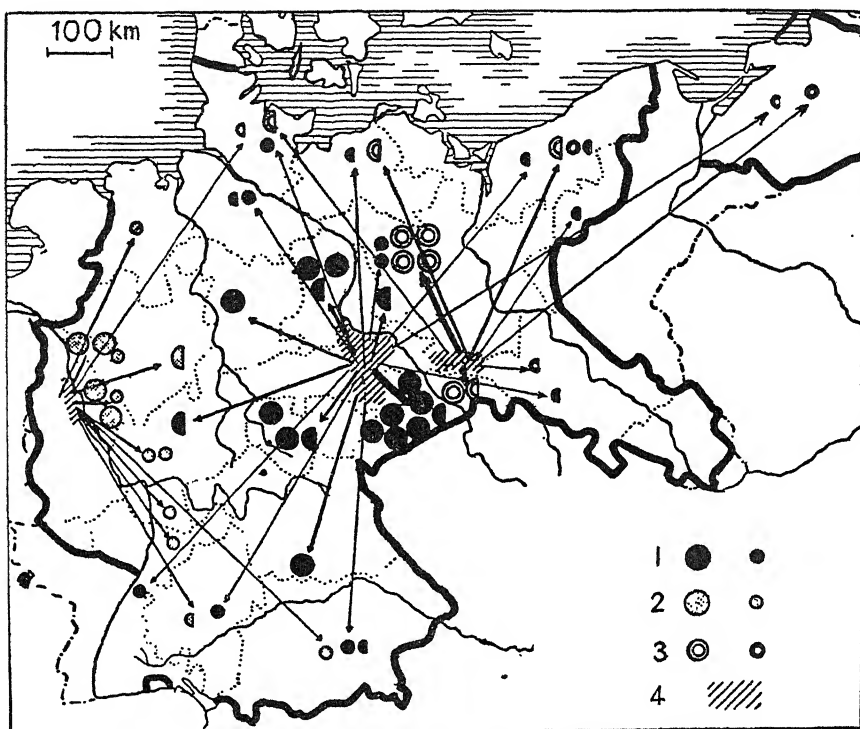


FIG. 43—GERMANY: LIGNITE PRODUCTION AND MOVEMENTS (pre-war)
(from Scheu, *Des Reiches Wirtschaftliche*) (scale, 1 : 10 m.)

Pre-war figures indicate movements from production districts (shaded (4)) to receiving districts (trade districts). Large circle represents 500,000 tons, small circle 100,000 tons.
1. From Middle Elbe basin. 2. From Lower Rhine. 3. From Brandenburg (Lusatia).

Of the metal industries, the manufacture of railroad stock and repair works is located particularly in relation to the great railroad focuses. The manufacture of agricultural implements is concentrated near the principal markets of the chief agricultural areas—the lower Rhine land (Düsseldorf), the middle Elbe basin (Leipzig, Magdeburg), Silesia and south Germany (Augsburg). The electrical industries are chiefly concentrated in Berlin and other large cities, especially in the lower Rhine land. The remaining large variety of machine industries show a marked concentration in four areas—the middle Elbe basin (western Saxony,

Ruhr. It brings out the great importance of central Germany, especially parts of Thuringia and the province of Saxony); Berlin; the lower Rhine land (heavier goods); the Rhine-Main region.

The great variety, complexity and specialization of the machine industries result in an active interregional exchange. Fig. 45 shows the pre-war exchange between the trade districts of Germany, excluding

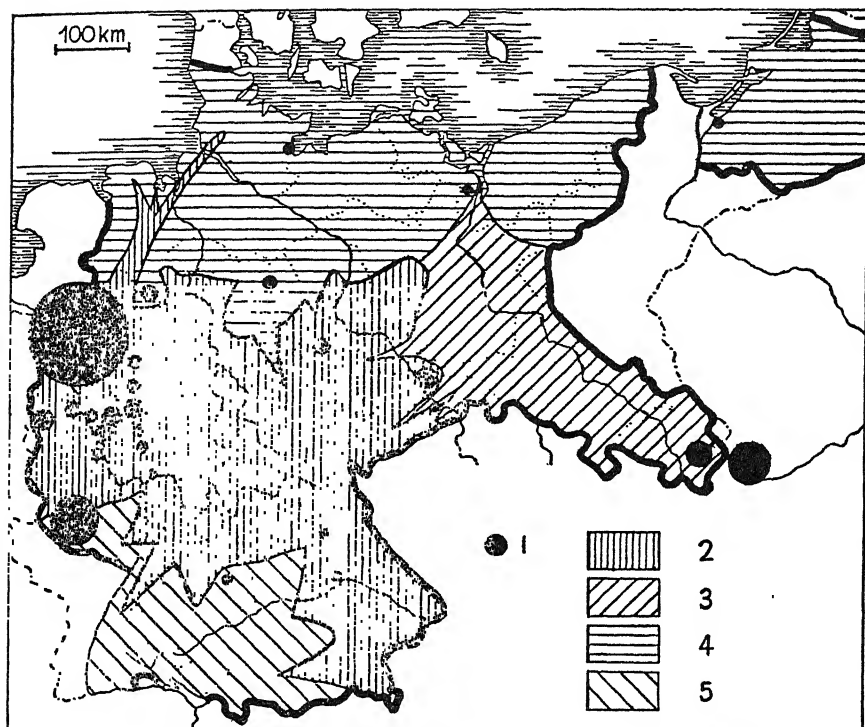


FIG. 44—GERMANY: IRON AND STEEL PRODUCTION AND MARKET AREAS (pre-war) (*from Scheu*) (scale, 1 : 10 m.)

1. 5,000 workers in the industry. Market areas of: 2. Rhineland-Westphalia. 3. Upper Silesia. 4. Lower Saxony and Coast. 5. Saar.

Saxony. From here the largest proportion of goods is sent to Berlin—with very little in return—but there is also a large traffic with Silesia, Thuringia, the province of Saxony, and Bavaria. The closed relationships of the southwestern trade districts and of Silesia indicate the existence here of a fairly contact trade association. The Ruhr specializes in heavier goods. Its chief customers, which send far more to the Ruhr (machinery and tools) than they receive, are Berlin and Saxony. The bulk of its exchange is with the contiguous industrial districts of the lower Rhine. The second and third diagrams (Figs. 46 and 47) show the

trade in machinery of the Ruhr, with central and northern Germany and with western and southern Germany. A remarkable fact revealed here is the close ties between Westphalia and the Rhineland provinces, and the big trade with Saxony and Berlin.

The distribution of the textile industries may be taken as a second example of commercial interchange (Fig. 37, p. 243). Because of

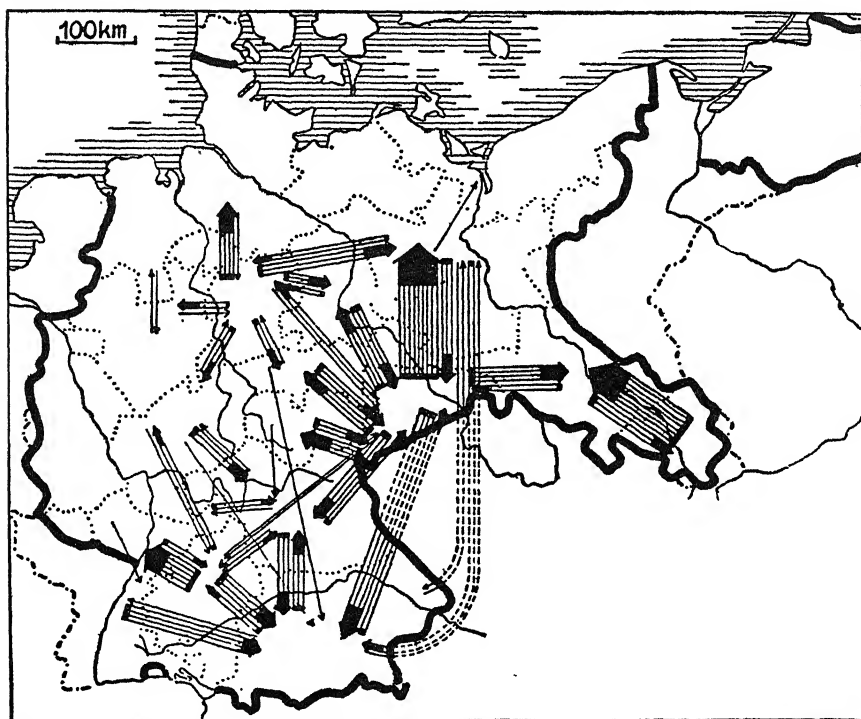


FIG. 45—GERMANY: TRADE IN MACHINERY (pre-war) (from Scheu) (scale, 1 : 10 m.)

Pre-war data of movements by trade districts. Arrow indicates direction of movement, each arrow representing 2,000 tons. The trade of the Ruhr is omitted (see Figs. 46, 47).

market concentration and specialization, there is a large exchange of yarns and cloths between the various textile districts. As to the trade in yarns, the lower Rhine region is an independent unit area of interchange; Württemberg is most closely connected with Saxony, Baden and southern Bavaria; Saxony has its closest relations with northern Bavaria (Hof), Thuringia and Silesia. There is also a movement of woven fabrics to the finishing factories. These, too, are specialized and localized. For example, the finishing cotton industry of Silesia treats principally south and west German cottons, which are then sent as finished goods to Berlin; and from Berlin they ultimately reach the consumer through the

FIG. 46—GERMANY: TRADE OF THE RUHR IN MACHINERY WITH EAST GERMANY (pre-war) (from Scheu) (scale, 1 : 12 m.)

Imports and exports of Westphalia (Ruhr area) from trade districts of eastern Germany. Each arrow represents 2,000 tons.

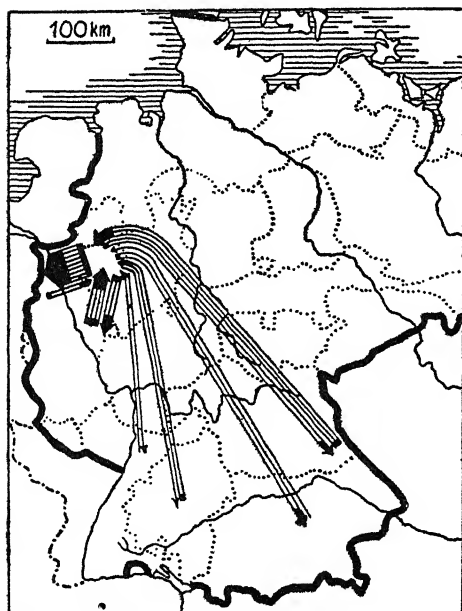
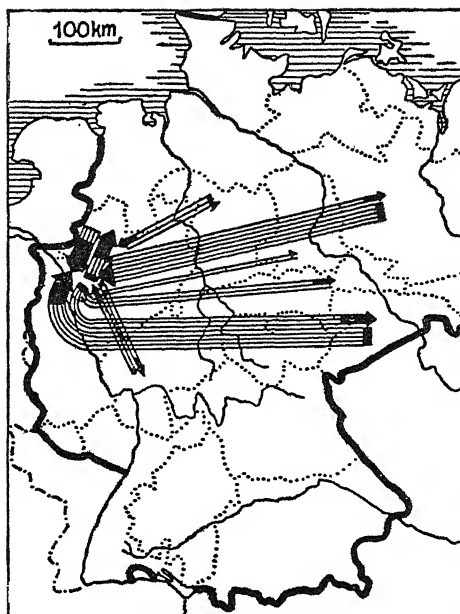


FIG. 47—GERMANY: TRADE OF THE RUHR IN MACHINERY WITH SOUTH GERMANY (pre-war) (from Scheu) (scale, 1 : 12 m.)

Imports and exports of Westphalia (Ruhr area) from and to trade districts of southern Germany. Each arrow represents 2,000 tons.

hands of wholesalers. Other areas finish locally produced cloths: for example, the cheap hosiery and clothing stuffs of Munich-Gladbach. Wholesaling is concentrated in the large cities for local and regional distribution. The Saxony area supplies central Germany and the lower Elbe and Baltic provinces; western Germany is supplied from such centres as Wuppertal (i.e. Elberfeld-Barmen), Munich-Gladbach and Frankfurt; and southern Germany from Stuttgart, Augsburg and Aschaffenburg.¹

PORTS AND THEIR HINTERLANDS

Another form of interregional integration is effected by the sea and river ports. Fig. 48 is an attempt to show the hinterlands of the chief ports.

The trade of Antwerp and Rotterdam is chiefly with the Rhine lands, the connections of the former being mainly by rail, of the latter by the Rhine, by which it is linked with its river ports. Rotterdam is the giant of the Rhine traffic; and almost all of its traffic is in transit to and from Germany—iron ores, grain, oil and timber going upstream, mostly coal, iron and steel goods coming downstream. Antwerp has a vast and varied overseas trade, which in its universality in respect of its character and distribution resembles London. It is the natural port of Belgium, transacting 80 per cent of her foreign trade. But of its total overseas trade between 40 and 50 per cent is in transit. Antwerp lacks a deep canal connection with the Rhine and its transit trade is effected pre-eminently by rail. Like Le Havre, it has the supreme advantage of proximity to the great lane of world shipping in the Channel, and it serves as a port of call for most ships which come to and from the North Sea ports; it has, moreover, in the lands west of the Rhine, the advantage over ports to the east of it, in both distance and cost. Its transit trade is large and extremely varied. It receives vast quantities of iron and steel goods from the Ruhr, potash from Alsace, and miscellaneous goods from the Rhine lands, northern and eastern France, south Germany and Switzerland. In 1939 the railways carried very nearly 1 million tons of goods between Antwerp and Alsace-Lorraine. Moreover, trade by the Rhine between Antwerp and Strasbourg has increased greatly, to over 1 million tons in 1931 in both directions, since the elimination in 1919 of the surtax which is charged on goods imported to France, which have already been handled in a foreign port. Amsterdam, as we have already seen, unlike Rotterdam, is entirely an artificial port. It has not a highly

¹ These maps from Scheu's work are now old, but they are for a good average year in the late 'twenties. There is a wealth of material on this subject of *Verflechtung* in German literature. See bibliography.

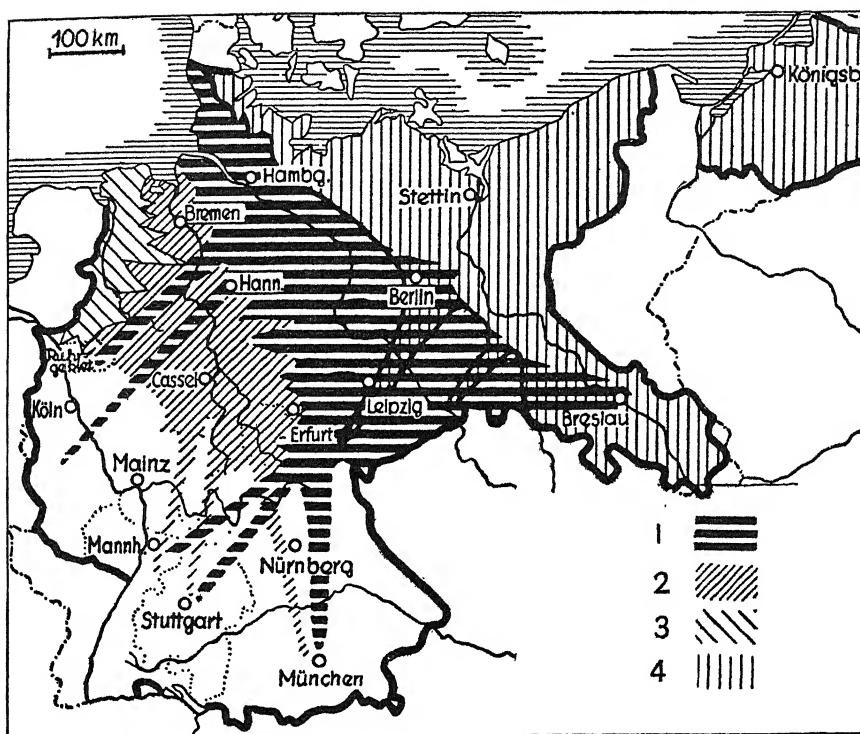


FIG. 48—GERMANY: HINTERLANDS OF THE CHIEF PORTS (pre-war) (from Scheu) (scale, 1 : 10 m.)

1. Hamburg 2. Bremen 3. Emden 4. Stettin

See F. W. Morgan's articles in *Trans. Inst. Brit. Geog.*, 1948 and *Geography*, Dec., 1949, for fuller studies.

developed *entrepôt* trade by rail, nor has it a direct deep-water connection with the Rhine, although, like Antwerp, it has aspirations.¹

We come next to the pre-war trade and hinterlands of the German ports, Hamburg and Bremen. These ports have been favoured by the Reich by all kinds of preferential freight rates, so that the distance factor is often virtually eliminated in order to compete with the ports of Antwerp and Rotterdam in dealing with the traffic of western Germany, and especially with that of Westphalia². Moreover, like Antwerp, both these

¹ The Rhine river traffic of Antwerp normally amounts to some 5 million tons, that of Amsterdam reaches 2.5 million tons. The traffic of the latter is carried by the Merwede canal, which can take 2,000-ton barges.

² By reduced freight rates it was sought to divert the cereal traffic of south Germany from Rotterdam to Hamburg. Basel, which is nearer to Antwerp by rail, receives deliveries of skins, cotton and tobacco and coffee from Hamburg. Munich has its geographical distance of 810 km. from Hamburg reduced to 500 km. by reduced freight rates. See Demangeon, *Le Rhin*.

ports are great *entrepôt* centres. Consequently they serve widely scattered populous centres throughout Germany, although it is possible on the basis of traffic statistics to give a fairly precise definition of the extent of their respective hinterlands.¹

About 18 million tons of goods entered the port of Hamburg in 1929 and 9 millions went out. Five million tons left Hamburg inland by water, of which 85 per cent stayed in Germany. The Elbe system is navigable to Berlin and Magdeburg for 1,000-ton barges and upstream to Prague for 600-ton barges. Through the Havel system it is connected with the Oder. (It has no connection with the Weser, hence the proposal for a Hansa canal to link with the latter and the Dortmund-Ems canal.) Large shipments of coal and smaller quantities of petroleum, wheat and timber went to Berlin (1.5 million tons), and 1.5 million tons to Magdeburg and Saxony (wheat, oil seeds, petroleum and coal). Upstream traffic thus consists mainly of fuel and bulky foodstuffs. Receipts from inland at Hamburg by water are less in weight than dispatches, the total being only about 3.7 million tons, a tenth of which is sand, earth and stone. The great bulk of this traffic comes from Magdeburg and the districts south of it (1.5 million tons), and Czechoslovakia (0.6 million tons). The former sends potash, salts, manures, paper, sugar, glass and briquettes, and refined sugar from Czechoslovakia.

Rail traffic is less easy to analyse since the distribution and collection is more diffuse. It is mainly with the whole of the Elbe basin and eastern Germany. Traffic flows in the Rhine lands, and especially in the Rhineland and Westphalia provinces and Frankfurt area, are peculiar, since these areas are not only geographically nearer to Rotterdam and Antwerp, but the former is also served direct by the Rhine, whereas Hamburg is much further away and has no direct water connection with the Rhine. A variety of special items are sent thither from Hamburg, though small in bulk, but there are large receipts of coal (3 million tons) and considerable quantities of iron and steel goods. These shipments to Hamburg, rather than to Rotterdam, are due to special preferential freight rates. It can be concluded, writes Sargent, that "for many, if not all purposes, both of import and export, the region south of Magdeburg is dependent on Hamburg; the same to be true of the agricultural regions east of the Elbe and south of Berlin and to a much smaller extent of the upper Oder. Beyond the frontier, the Prague region uses Hamburg for special purposes and goods, while Westphalia and the Rhine can only be considered as related to Hamburg artificially. Hamburg is the port for certain areas, either for general or special goods."¹ But it is not the only port.

¹ A. J. Sargent, *Seaports and Hinterlands*, p. 43.

The Baltic ports are dominant in Silesia, Hamburg taking a little more than a quarter of the traffic. Stettin serves Berlin also (mainly to Berlin) but in a very subsidiary degree to Hamburg. The Ems and Weser ports of Emden and Bremen have a special position. Emden has direct contact with the Ruhr by canal and serves it with large quantities of iron ore (2 million tons) from Scandinavia, and receives coke and coal (1.6 million tons). There is no really effective competition with Hamburg. Bremen has inland waterway connections with the Weser (though much inferior to the Elbe) and with the Dortmund-Ems system via the Mittelland canal, by which it receives half a million tons of coal from Westphalia—and again there is no competition with Hamburg. There are three main streams of railway traffic from Bremen—to Bavaria; to Westphalia, the Ruhr, and the Rhine; and southeast beyond Magdeburg to the middle Elbe basin. In addition there is a widely distributed foreign traffic.

There is obviously a wide overlap of Bremen's hinterland with the Hamburg sphere in the east, and the Rhine ports and Antwerp in the west. This latter traffic is in small consignments of raw material (such as cotton), minor foodstuffs and manufactured goods. As an outlet by rail, Bremen receives the large amount of 3 million tons, but three-quarters is drawn from Westphalia and the Ruhr—coal, coke and briquettes, iron and steel goods. Considerable quantities of goods are also drawn from the middle Elbe basin (potash, salt, glass, miscellaneous manufactures). This overlaps again with the Hamburg trade.

Thus in the pre-war picture, Hamburg is dominant beyond the middle Elbe, including Berlin. In the middle Elbe basin south of Magdeburg, the advantage in rail and water is with Hamburg, and Bremen takes less than a tenth of all traffic. Between the Elbe and Weser the movements are complex but rail figures indicate a slight advantage to Bremen. In south Germany, Hamburg leads decisively and has a slight advantage over Bremen in the Westphalian traffic, in spite of the latter's waterway connection. In Silesia and south Germany, the position is that the main traffic has outlets other than Hamburg, although that through Hamburg is not unimportant. Westphalia is a very subsidiary hinterland, and this applies also to Czechoslovakia. These areas are described by Sargent as "subsidiary hinterlands", and in no case can geographical boundaries be defined with any approach to reality.

Rotterdam dominates the traffic on the Rhine and feeds the German ports on the Rhine, notably Duisburg-Ruhr and Mannheim-Ludwigs-hafen. On the Dutch-German frontier 18 million tons passed upstream from Rotterdam in 1929. About 10 million tons was iron ore and 1 million other ores; 2 million tons of grain, and timber, oil seeds and petroleum. Downstream to Rotterdam moved 15 million tons, 12 millions being coal, coke and briquettes. Railway traffic is relatively small—in, 2

million tons; out, 1 million tons—and nearly all this is with the national hinterland in Holland. It is essentially a coal and ore transit port, but there is some organized marketing of maize, wheat, coffee and pepper, though in Holland it is secondary to Amsterdam and completely dwarfed by Hamburg-Bremen.

Antwerp is essentially a railway port in foreign trade—though it serves the densely populated hinterland of Belgium by rail and water with three-quarters of its overseas trade. As a rail port for foreign trade, Antwerp has no rival in the whole region north of Strasbourg, for rail traffic between Westphalia and Rotterdam is very small. Antwerp is connected with the Rhine by a circuitous route and the improvement of such direct communication is a question of international politics. Antwerp has developed as a great transport centre from rail to boat and has numerous liner connections; it is also a favourite port of call. Its cargoes, in and out, are thus extremely varied and in small consignments, resembling London. About 40 to 45 per cent of the imports and rather more of the exports belong to the international transit movement, and as traffic is affected mainly by rail, it is widely dispersed. Official figures of transit traffic reveal that grain (1·4 million tons) is sent inland to Strasbourg, together with iron ore (2 million tons) to the Saar. Wool is sent to eastern France and in less degree to Germany. There is a great movement of iron and steel goods of German origin (1·25 million tons) and a great variety of manufactured products from the lower Rhine area, eastern France, southern Germany and Switzerland, and even Italy. In this trade, iron ores and grain go up and down the Rhine to and from Germany, but in smaller quantities than in the case of Rotterdam, which is Antwerp's competitor in these commodities. The great bulk of all this international traffic, however, even with Germany, is affected by rail, and the whole structure and organization of the port of Antwerp is designed to this effect.

Thus, the Ruhr is the main hinterland of Rotterdam, while Antwerp has a very large rail traffic with the Ruhr. Away from the Rhine river, in the Rhinelands, Antwerp has the advantage over Rotterdam, but it has to meet the competition of the French Channel ports and of the Mediterranean ports of Marseilles and Genoa.

Hamburg and Bremen share about equally the rail-borne traffic of the Hanover-Brunswick district in lower Saxony, between the Elbe and the Weser. They both draw large quantities of goods from Westphalia, mainly coal, although on grounds of distance and cheapness of water transport Rotterdam would be the obvious outlet; the large proportion of the total trade taken by the German ports, together with Emden, is due mainly to preferential railway rates. But throughout the Elbe basin, as far as northern Bohemia, Hamburg is the main port, although there is a sprinkling of traffic to and from Bremen. The main hinterland of Ham-

burg (i.e. the area in which it transacts the bulk of the foreign trade) also includes Schleswig-Holstein, Mecklenburg, Brandenburg and Berlin. In south Germany both ports draw upon scattered big cities and the scattered seats of industry, again due in large measure to cheap freight rates, as against the Rhine port of Mannheim, but in this trade Hamburg has a decisive lead over Bremen. Both ports also receive and dispatch by rail considerable quantities of goods to and from Switzerland, Austria, and Bohemia.

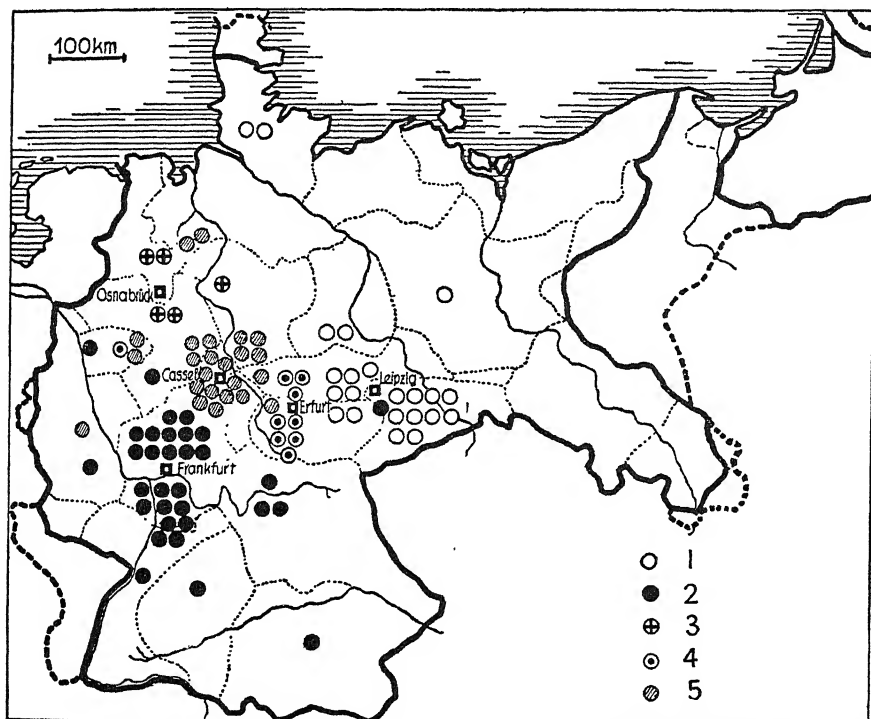


FIG. 49—GERMANY: EXPORTS OF SELECTED CITIES TO TRADE DISTRICTS (pre-war) (from Scheu) (scale, 1 : 10 m.)

Movements by trade districts (pre-war). Each circle represents 25,000 tons: despatch of goods from each city to other trade districts.

1. Leipzig. 2. Frankfurt. 3. Osnabruck. 4. Erfurt. 5. Cassel.

It was primarily to divert the iron-ore traffic from Rotterdam that the Dortmund-Ems canal was built (1892-8) and the modern port of Emden created. Traffic on this route reached 9 million tons in 1928. The traffic of Emden reached some 4 million tons, and consisted of coal from Westphalia, and iron ore and coke upstream to Westphalia.

The Baltic ports, of which the chief is Stettin,¹ have a fairly large water

¹ Stettin has a trade of 1½ million tons, mainly imports of iron ore, pyrites and timber.

traffic with Berlin (1 million tons), the main constituents being coal and coke, most of which came from Upper Silesia. While the Oder ports took only a small share of the Berlin-Brandenburg traffic, they monopolized most of the traffic in Silesia by the river and by rail, to the extent of three-quarters of the entire traffic, most of the remainder going to Hamburg.

The North Sea and Baltic ports serve primarily the areas drained by the chief German rivers. To the east, however, is situated Poland, and its foreign trade is mainly concentrated on the overseas ports of Danzig and Gdynia.

COMMERCIAL REGIONS

It is upon a full appraisal of all such material that the following division of Germany into its commercial regions has been based. This subject is discussed at greater length in our book on *The Regions of Germany*. Especial emphasis is given in this study to the regional relations of the principal cities. The rail traffic of several cities is shown in Fig. 49; other cities are studied more closely in later chapters. The regions, as determined from this great variety of evidence, are shown on Fig. 50. These are areas in which all places are closely knit together by trade, transport, and general organization and interest. Trade between their component traffic districts amounts to at least a half of all trade throughout the Reich.

Pomerania and East Prussia. The Baltic provinces have a distinct type of agriculture, characterized by large holdings, a low density of population, and a large surplus of rye, potatoes and dairy products. They fall into two distinct areas of orientation, however: Pomerania (including Vor Pommern), with its centre in Stettin; and East Prussia, isolated by the Corridor, with its centre in Königsberg. Both these areas, each of them a political entity, have been absorbed by Poland and Russia. Vor Pommern alone remains in Potsdam Germany.

Nordmark. Schleswig-Holstein is closely connected with Mecklenburg, but both are distinct political units of many centuries' standing. Together they are often referred to as the Nordmark. Agriculturally it is dominated by the raising and fattening of stock and by dairy farming. Culturally and in its modern organization, Schleswig-Holstein is associated with Lower Saxony, west of the Elbe. Commercially, it is largely focused on Hamburg, an association strengthened by a community of economic interest with Kiel and Lübeck and by the existence of the Kiel canal. The lower Elbe area is closely affiliated with it. Hamburg, like Bremen, offers a peculiar problem. These two great ports are large isolated urban agglomerations with very specialized functions and interests and enjoy a long-standing political independence as free cities.

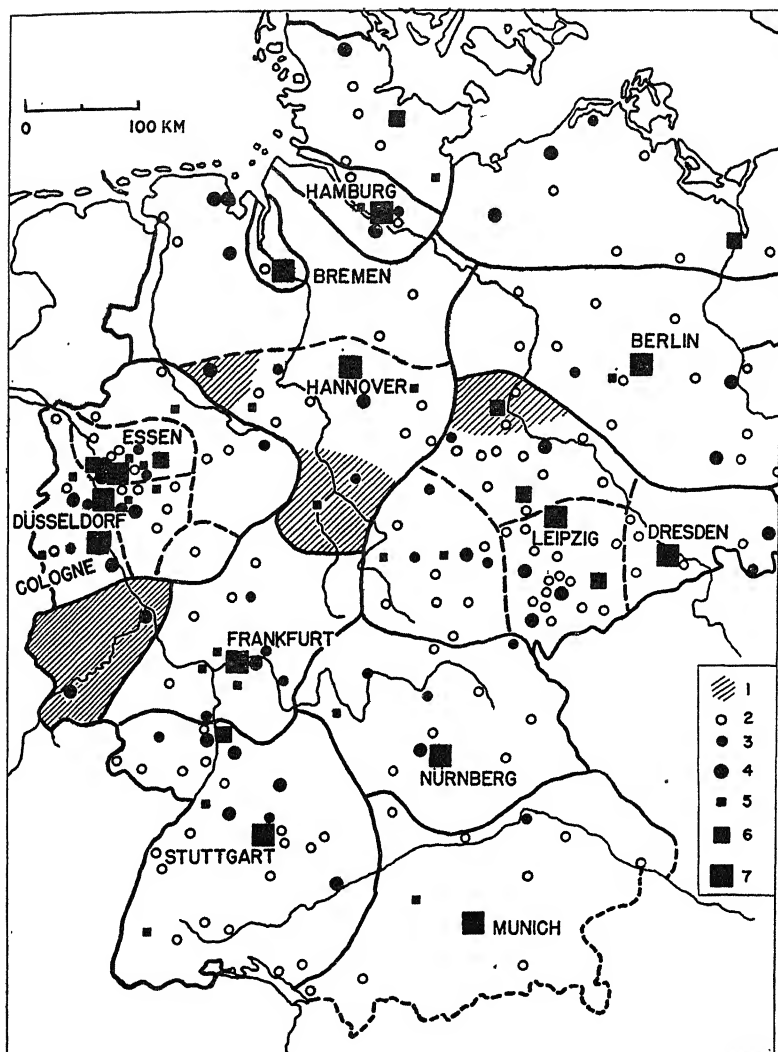


FIG. 50—GERMANY: COMMERCIAL REGIONS AND COMMERCIAL CENTRES (*according to the author*) (scale, 1 : 6 m.)

- | | |
|--|----------------|
| 1. Transitional areas | 4. 8-15,000 |
| Persons in centralized urban services: | 5. 15-30,000 |
| 2. Under 5,000 | 6. 30-50,000 |
| 3. 3-8,000 | 7. Over 50,000 |

Sub-divisions of the major regions are shown by dashed lines. The shaded areas have close relations with two or more regions. The commercial centres are defined on pp. 174-6.

The lower Elbe and the lower Weser are, in fact, two distinct economic units, the independent political status of which has been generally advocated in inter-war schemes for a federal Germany. An important step in this direction was taken by the Reich in the spring of 1936 by the extension of the political boundaries of Hamburg to include Altona and Harburg-Wilhelmsburg (the port and contiguous areas on the left bank of the river). Lübeck, long the mistress of the Hanseatic League, also commanded the overland routes across the peninsula. Two canals, built about 1400 and 1500, connected the city with the lower Elbe. Lübeck declined with the decline of the Hanseatic League, and its functions have been acquired by Kiel, which is the terminus of rail and the ship canal across the head of the peninsula, as well as being a naval and shipbuilding base.

Brandenburg is limited to the south by a belt of sandy uplands, that extends from northern Silesia through the Fläming to the Lüneburg Heath uplands. The life of the whole area is tied up with Berlin. With it must be included the lignite-field of Lower Lusatia, which exports the bulk of its production to Berlin either as briquettes or in the form of electricity, and where, too, the textile industries grew up largely in the nineteenth century as offshoots of Berlin firms or through migration from Berlin.

Lower Saxony is a distinct cultural and economic entity which finds expression in most regional organizations. It contains the reclaimed areas of the *Geest* and *Marschen*, important areas of beef and dairying production; the loessic loams to the south, which support a portion of the beet-wheat agricultural belt; an industrial axis based on minerals in the Harz, brown coal in its foreland in the east, and iron-mining near Osnabrück in the west; and, to the south, part of the Central Uplands. It is crossed by ancient and modern routes by land and water, which, running east-west or north-south, have their chief focus in Hanover, the regional capital. The peripheral areas are notoriously transitional. The Osnabrück area, for example, is also closely connected with Westphalia, and the Kassel area with Frankfurt. The region occupies one-tenth of the employed persons of the Reich, and draws its power mainly from coal and gas. This is the new *Land* of Niedersachsen.

The Lower Rhineland (Rhineland-Westphalia) has its axis in the coal and lignite-fields and their related industries. This axis extends almost without interruption from the frontier at Aachen to the eastern extremity of the Ruhr. The transport facilities offered by the Rhine have called into being ancient cities, ports and new heavy industries. The Münster (Westphalian) lowland and the Rhine Massif are brought into the orbit of this urban complex as sources of food supply. The iron-mining area of the Siegerland should also be included in it. The Coblenz area,

however, with its vineyards and quarries, must be regarded as transitional between the Lower Rhineland and the Rhine-Main province. It employs 20 per cent of the working population of the Reich. Out of a total population of some 12 millions, over 50 per cent live in towns with over 50,000 inhabitants. Its railroad net has a density of 184 km. per 1,000 sq. km. It has five cities with 500,000 to 1,000,000 inhabitants (Cologne, Düsseldorf, Essen, Dortmund and Wuppertal) and about a dozen with over 100,000 inhabitants.

The common interests of the whole of the lowland zone is reflected in the extent of the area of the *Ruhrsiedlungsverband*, established in 1921. This area extends from Hamm in the east to the frontier of Holland in the west. Throughout this extensive area the organization has authority to zone and plan communications, open spaces and water supply. Moreover, the whole of the northwestern lowland and much of the Rhine Massif send in food supplies, especially milk and livestock, to the urban areas. Especially significant are the interrelations of the two areas on either side of the Rhine as revealed by traffic returns for trade districts. The Ruhr, together with Aachen, dispatched in 1935 82 million tons of coal, briquettes and coke. Much of this was carried on the Rhine for long-distance shipments, 16.5 million tons reaching the Low Countries, 1 million tons Alsace and Switzerland, 6.8 million tons German ports on the Rhine and the Main, 3 million tons to German seaports and 1.5 million tons to other ports of the lower Rhine. But the railways carried over 50 million tons, of which the great bulk was carried over short distances, over a half being consignments between Rhineland and Westphalia. If we exclude the dispatches to ports and directly abroad then one-half of the total fuel traffic of Germany is carried in this province. Moreover Westphalia is fed with electricity derived from the great generating plants on the lignite-field west of Cologne. These facts emphasize the economic interdependence of the Rhineland and Westphalia provinces and the relative importance of rail and water in their traffic. This is, in effect, the new *Land* of North Rhine-Westphalia.

The Middle Rhine (Rhine-Main) has its traditional focus in Frankfurt, which contains about one-sixth of its total population of 4 millions. The heartland is formed by the urban belt Mainz-Frankfurt-Aschaffenburg. The routeway of the Rhine and the continuance of old industries have created a great industrial area—chemicals, leather and engineering. It is also an area of intensive agriculture characterized by small-holdings, with an output of fruits, vines and tobacco. This is the new *Land* of Hessen.

The Southwest. The upper Rhine plain in its productive aspects shows essentially the same features from Mainz to Basel. But the association of its southern portion (south of the middle Rhine region) is eastwards

with Württemberg and westwards with the Palatinate and the Saar. Small family holdings are found throughout, and domestic industries are characteristic of Baden and Württemberg. The capital is Stuttgart; but Mannheim-Ludwigshafen is the chief centre of the heavy industries (chemicals) and the chief river port of the upper Rhine, and serves as the chief distributor of imported supplies.¹

The overwhelming orientation of the railway goods traffic of the Palatinate to the port of Ludwigshafen-Mannheim is a notable feature. Ludwigshafen has a heavy traffic as a river port, redistributing and collecting from and to the port, as well as servicing its heavy industries (metals, chemicals, timber, paper). The trade of Mannheim as a river port for southwest Germany suffered after 1918 from the cession of Alsace-Lorraine, and the improvement of navigation of the Rhine and of port facilities at Strasbourg to serve these provinces. The bulkiest product passing through the Mannheim-Ludwigshafen district is coal which comes mainly (two-thirds) upstream from the Ruhr—with the balance drawn from the Saar, for distribution in southwest Germany by rail. Coal makes up 60 per cent of its total traffic in industrial goods with the six trade districts of the southwest, mineral oils and chemicals coming second with 20 per cent. The Saar, in spite of its orientation to France between the wars, continued to send coal and semi-manufactured iron and steel products direct to south Germany and to Mannheim-Ludwigshafen.

The direction and intensity of commercial relations may be judged from the movements of workers (*Pendelverkehr*), traffic by rail and water, and the distribution of electricity. In Baden, the two chief centres of employment are Mannheim and Pforzheim. The former draws heavily on workers from across the river in Ludwigshafen and further afield in the Palatinate. The jewellery industries of Pforzheim draw many daily workers from Württemberg. In the latter, Heilbronn is the chief centre, drawing many of its workers from Baden.

Bavaria is usually regarded as a single political unit for nation-wide administrative purposes. But it falls into two parts—northern and southern—which are approximately divided by the Danube. In culture, history and agriculture these two parts are distinct, and each has its own commercial and industrial capital—Nuremberg and Munich respectively.

Silesia, in its pre-war outline, contained a threefold combination of Sudetic uplands (dairying and industry), a heartland of wheat-beet production, and an eastern zone of relatively unproductive country with rye and potato cultivation. Breslau and Upper Silesia are its two principal industrial areas, and Breslau is its metropolitan centre; on three sides its limits are fixed by international frontiers. Silesia was regarded as a

¹ The area consists of the six trade districts of Württemberg, Baden, Bavarian Palatinate, Hesse, Saar and Mannheim-Ludwigshafen.

unit area for most administrative purposes. It is one of the permanent political units of Europe that lies on the borderland of German and Pole, and has fluctuated in its political allegiance between Poland, the Habsburgs (Bohemia) and, since the days of the middle of the eighteenth century, Prussia. Its historical nucleus was the populous loess land in the centre, with its capital in Breslau. The growth of metal-working and later of textile industries in the Sudetes, and later of the great coal-field at its southern extremity, gave it economic diversity and conflicting regional associations that crossed the political frontiers of the Reich. In spite of that it became a highly Germanized province under Prussian rule. World War II has transferred the whole province to Poland.

Central Germany (Mitteldeutschland) is the economic epitome and heartland of Germany. It consists of a zone of encircling uplands—Harz, Thuringian Forest and Erzgebirge—and a heartland of fertile lowland—the Saxon Bay. This heartland, and indeed the region as a whole, is bounded on the north by a belt of unproductive uplands, with sandy soils in which heath and pine woods are intermixed with fields of rye and potatoes. The encircling uplands is the site of old, established domestic industries, now often concentrated in factories. The most outstanding are the textile and machinery industries of Saxony and Thuringia. The loess area, with its wheat and beet farming, contains brown coal and salt deposits. The rapid development of these resources led to the growth during and since the 1914-18 war of a vast industrial complex that extends from south of Leipzig to Brunswick. Throughout the region there is a dense route network and an economic interdependence that, as measured by goods traffic, exceeds the relations of its parts with any single neighbour. The chief metropolitan centres are Leipzig, Dresden, Magdeburg and Chemnitz. Leipzig, with its neighbour and competitor Halle, is the geographical focus and the chief commercial centre for the whole region. Saxony, next to the Ruhr, is the most highly industrialized region of the Reich, with over 50 per cent of its population dependent on industry, 17 per cent on commerce, and only 9 per cent on agriculture. Saxony, in particular, is a very large importer of foodstuffs. The whole region of central Germany had 20 per cent of the industrial population of the Reich, consumed 16 per cent of its total power, in which lignite, not coal, was the almost exclusive source of its electricity and fuel supply. This complex today lies in the *Länder* of Saxony and Saxony-Anhalt in the Soviet Zone of Occupation.

CHAPTER 12

THE FOREIGN TRADE OF GERMANY

GENERAL

HIGH POPULATION densities and high urbanization are found throughout western and central Europe from the Alps and the Pyrenees north to the limits of the closely settled lands in the north, which roughly correspond with latitude 60° in southern Scandinavia and Finland. In France, the density of population and degree of urbanization are for the whole country relatively low, but this obscures the fact that there are highly industrialized areas, with large urban agglomerations, concentrated in the northern and eastern departments. In east-central Europe, in all the states from the Gulf of Finland to Greece, the density of population and the degree of urbanization are small; these lands differ from west and west-central Europe in their economic and cultural make-up. Here, metropolitan urbanism is confined to a single big city which in some cases far exceeds the needs of its country—as in the Baltic provinces. In these capital cities are concentrated the bulk of the industry and commerce of their states, and the small country town is an overgrown village, semi-urban in character. Western civilization has penetrated into these lands in varying measure. It is strongest in western Poland, Bohemia-Moravia and, to a less degree, in western Hungary. Thus, the progressive lands of western and central Europe, which are at one in the main features of their cultural background and their modern economic development, characterized by high agricultural and industrial output and the dominance of its commercialized economy by the city, stand in marked contrast to the culture spheres of eastern Europe and Mediterranean Europe. If we include all the chief seats of population and industry in Europe, we find that they are all embraced by a circle with a radius of some five hundred miles and its centre about Cologne—including the British Isles, northern Italy and southern Scandinavia. This whole area has a population of some 200 millions, and 85 millions are engaged in industry.

A large portion of this area on the Continent is characterized by an especially high density of population, a high proportion of urban population, a high agricultural output per acre and *per capita*, a great intensity of industrial production, and, lastly, by the great intensity of commercial circulation, as evidenced by its dense network of railways and

roads. This area is clearly defined on the west by an arc joining Calais, Toul and Geneva, to the west of which, covering the greater part of France, densities are lower, urban population is smaller, and industry is typically pursued in small towns and is of a highly skilled character. The large cities of Paris, Lille, Lyons-St. Etienne, and the ports of Marseilles and Nantes, are the only seats of great industry in rural France. The southern limit of the area is clearly defined by the wide, thinly peopled belt of the Alps, which divides it from the thickly peopled agricultural and industrial region of the Po basin, the economic hub of modern Italy.

To the east, against the widening trunk of Continental Europe, there is not such a clearly marked break in the density of population. On the contrary, there is a wide zone of medium density, which extends from Slovenia, encircles the eastern Alps in Austria and western Hungary, continues through the Vienna basin and Moravia, thence through the industrial area of Upper Silesia, its most thickly peopled section, and thence into southern and central Poland, an area which, north of the Vistula, was as thinly peopled as the rest of the Northern Lowlands in 1871. This border zone is one of considerable fertility and of high agricultural output. Modern industry has extended into it in the last hundred years, and at an accelerated rate since 1918. It is populated for the most part by non-German peoples, mainly Slavs, but its recent economic development has undoubtedly been due in no little measure to German enterprise.

To the east of this eastern border zone we encounter lands which are more thinly peopled, with large areas still available for rural settlement. It is dominantly a zone of agrarian life. Its towns are small and few, and the urban population is less than 20 per cent of the total. Eastern Poland (east of a line from Vilna, Brest-Litovsk and Lwow) has more than 80 per cent of the population engaged in agriculture and less than 20 per cent live in towns, as opposed to the western provinces (Poznan, Lodz and Warsaw) to the west of the line, where the aggregate urban population is 30 and 40 per cent of the total. The Carpathians have scanty population, and in their extreme northwestern periphery the Beskides are a clear limit to the populous area of southern Poland, while the White mountains limit the populous area of Moravia. The middle Danube lands have low densities and large areas are very thinly peopled; the urban density also is extremely low, Budapest being the only large city. Both Galicia, which merges into the Ukraine on the northern side of the Carpathians, and the Alföld within the Carpathian "swirl" are regions of great fertility. They are both devoted mainly to agriculture; they each have a fairly high density of rural population, but their urban population is very small, and the difference between village and town

difficult to define. Throughout this zone of east-central Europe town life is not highly developed, and the town includes a medley of people, among whom the Jew is a conspicuous element, frequently in the majority, and in control of the trade. Corporate life is undeveloped, and public services and social amenities backward as compared with western Europe. The majority of the so-called towns are in fact overgrown villages in which the peasantry make up the bulk of the inhabitants; only secondarily are they markets. In western and central Europe, on the other hand, the town is primarily a seat of industry and commerce, and though it contained a considerable farming element in the past, today this is usually quite negligible.

OVERSEAS TRADE

The dependence of Germany on foreign countries for the supply of its deficiencies of foodstuffs and raw materials and for the absorption of its manufactured products was a feature of its pre-war trade that developed from 1870 to 1913. The aggregate value of imports reached a peak in the late 'twenties and slumped in the early 'thirties. The Nazi programme aimed at the reduction of imports to a minimum and a careful regulation of the kinds of products imported. The value of imports in 1939 reached 6,000 million Reichsmarks, while exports were down to 5,500 million Reichsmarks. These totals compare with 14,000 million and 12,275 million Reichsmarks respectively in 1928, the peak of the last boom period of the German economy. The imports and exports are vital to the sustenance of the economy and to the established standard of living of the people, and though reduced and regulated by the Nazis in the 'thirties, they have retained essentially the same features in kind and geographical distribution throughout the first half of this century.

Immediately before the railway age, Germany's main export was corn, together with oil seeds, vegetable oils, wine, some meat and dairy produce. Merino wool was still sent in considerable quantities to England for manufacture. German manufactures did not yet figure as important items in its exports or in the European markets. This foreign trade changed with the change in economic structure inside Germany. Her trade balance was still "favourable" in the 'eighties, but then it began to turn, and became regularly "unfavourable" during the 'nineties. Her food imports grew steadily after 1890. In the 'eighties Germany spent 40 to 50 million Reichsmarks on imports, but in the 'nineties this nearly doubled, and in 1912 the figure reached 160 millions.

Agriculture has sought to feed the growing urban millions in both essential foodstuffs and luxury produce, and succeeded to the extent of

80 per cent of the country's needs. In the aggregate this proportion was the same in the later 'thirties as in 1914. Germany was self-sufficing in rye, potatoes, meat and sugar. She supplied the greater part of her wheat consumption, but imports varied according to the harvest, and a bad harvest was normally reflected in high imports and vice versa. In bad years, she imported about 30 per cent of her consumption as in 1937, when wheat imports reached 1-2 million tons. There was also a steady increase in imports of eggs and butter and cheese, of which about 40 and 20 per cent respectively of her consumption were imported. Livestock production was intensified (both beef and dairy stock) by using feedstuffs, imports of which have increased fivefold in the last fifty years. Industry, too, reached such a high-level production at the turn of the century that it was dependent on foreign markets for the disposal of its surplus above home consumption. The Reich was also increasingly dependent on foreign sources for the commodities that could not be produced at all or which she did not possess in sufficient quantities.

Foreign trade is a vital necessity to the maintenance of the *status quo* of the economic system of Germany, and there is a remarkable steadiness in the character and proportions of its imports and exports between the wars. Of the imports by value in 1938 roughly 40 per cent consisted of food supplies, 50 per cent of raw materials and semi-manufactured goods, and 8 per cent of manufactured goods. Of the exports, on the other hand, about 80 per cent were manufactured goods and 20 per cent raw materials and semi-manufactured goods.

In 1938 Germany imported 62.6 million tons of commodities. The most important of these, covering 88 per cent of the total tonnage, may be classed as follows as percentages of the total tonnage: ores, 51; coals and coke, 13; cereals, nuts, coffee, tobacco, 11; mineral oils, 9; textile fibres, rubber and pulp, 5; metals, 5; fats and meats, 3; fertilizers and animal feedstuffs, 3. About one-half of these total imports came from overseas through the ports.

The tonnage of overseas exports and imports in 1938 was approximately the same in 1938 as in 1928. In the more recent year the exports reached 15 million tons and the imports 33 millions. Outstanding among the exports were coal (4.3 million tons), coke (1.0) and fertilizers (1.1) and iron and steel goods. Of the imports (33.4 million tons) wheat (0.8), maize (1.6), fruits, (0.5), oil seeds (1.3), iron ores (5.2), coal (4.6), petroleum oil (1.0) and oil derivatives (3.6) were among the chief items.

The foreign trade of Germany, as we should expect of a highly industrialized country with world-wide connections, was widely distributed and was not dominated by any single state, as often obtains in the case of small countries. In other words, extra-European trade accounted for about a half of the trade imports and about three-tenths of the exports.

Overseas trade was dominated by the New World. These countries provided Germany with foodstuffs and raw materials, and absorbed large quantities of its manufactured goods. The United States sent in 1938 large quantities of maize (80), cotton (45), oil (84), wheat (19), and iron ore (25) and copper (50). The Argentine supplied wheat (18), barley (12), oats (8.5), maize (48), meat (24), wool and cotton (45), skins (16) and oil seeds (20). Brazil supplied wool and cotton (77), coffee (58) and skins (17). Chile supplied wool (17) and copper (21). The above figures

Exports (millions of Reichsmarks), 1928-43
(Total and percentages in main groups)

(From *Statistisches Handbuch von Deutschland*, 1949, pp. 392-5)

	<i>Total</i>	<i>Foodstuffs</i>	<i>Raw Materials</i>	<i>Semi-processed Materials</i>	<i>Finished Goods</i>
1913	10,087	12.0	13.4	10.7	63.9
1928	12,275	6.4	12.2	12.2	69.2
1938	5,619	1.2	9.5	8.4	80.8
1943	8,588	6.8	13.1	13.0	66.9

Imports (millions of Reichsmarks), 1928-43

	<i>Total</i>	<i>Foodstuffs</i>	<i>Raw Materials</i>	<i>Semi-processed Materials</i>	<i>Finished Goods</i>
1913	10,769	38.2	34.9	17.2	9.7
1928	14,001	40.9	28.3	17.9	12.9
1938	6,051	39.5	32.9	18.8	7.9
1943	8,258	40.0	13.5	13.1	32.4

Foreign Trade of Germany, 1928-38

(From *Statistisches Handbuch von Deutschland*, 1949, pp. 410-13)

Geographic Distribution of Imports (millions of Reichsmarks)

	1928	%	1938	%
Europe ..	7,243	51.5	2,966	54.4
Africa ..	710	5.1	385	7.1
Asia ..	1,587	11.3	619	11.4
America ..	4,137	29.4	1,391	25.5
Australia ..	362	2.6	66	1.2
TOTAL ..	14,051	100.0	5,449	100.0

Geographic Distribution of Exports (millions of Reichsmarks)

	1928	%	1938	%
Europe ..	9,053	75.4	3,665	69.7
Africa ..	280	2.3	203	3.9
Asia ..	857	7.1	523	9.9
America ..	1,757	14.6	811	15.5
Australia ..	76	0.6	49	0.9
TOTAL ..	12,029	100.0	5,257	100.0

The principal participants in the American trade (1938) were the United States (exports 149, imports 404), Argentine (exports 147, imports 216), Brazil (exports 161, imports 214).

Imports by Commodities, 1933-37 (from *Statistisches Handbuch von Deutschland*, 1949, pp. 396-400)

Column (1) shows thousands of tons, column (2) millions of Reichsmarks.

	(1)	(2)		(1)	(2)
<i>Live Animals</i>	110	62.6	<i>Manufactured</i>		
<i>Food and Drinks</i>	4,551	1,125.0	<i>Goods and Semi-</i>		
Wheat ..	574		<i>manufactured</i>		
Rye ..	143		<i>Goods</i> ..	39,563	2,244.8
Barley ..	249		Wool ..	158	
Oats ..	64		Cotton ..	389	
Maize ..	651		Flax ..	229	
Rice ..	236		Animal Fats ..	196	
Vegetables ..	278		Timber ..	2,376	
Fruits (non-			Coal ..	4,452	
citrous) ..	361		Lignite ..	1,700	
Citrous Fruits	532		Coke ..	663	
Coffee ..	152		Mineral Oils ..	3,600	
Fish ..	226		Phosphates ..	877	
<i>Food Materials</i>	2,272	444.2	Stones and Earths	1,795	
Tobacco ..	124		Iron Ores ..	13,198	
Oil Seeds ..	1,834		Sulphur ..	1,072	
Oil Cake ..	224		<i>Finished Manu-</i>		
			<i>factured Products</i>	1,240	610.0
TOTAL	6,953	1,631.8	TOTAL ..	40,803	2,854.8

are all in millions of Reichsmarks. In return these countries absorbed German manufactured products.

Of the imports, about a third of the butter came from Denmark, half of the cheese from the Netherlands; meat came from the Argentine and Uruguay, Poland and Denmark; eggs from Denmark and the Netherlands; maize from the United States and Argentine; non-citrous fruits

from Bulgaria, Italy and Turkey; citrous fruits from the Mediterranean lands; cocoa from British West Africa, Brazil and Ecuador; edible oils, fruits—a large import—from British tropical lands and Manchuria; coffee from Brazil and central America; tobacco from Bulgaria, Greece, Turkey and the Netherland East Indies; and wine from Italy. Wool came from the Union of South Africa, Australia, Argentine, France and Belgium; cotton from Brazil (the biggest contributor), the United States and Egypt; flax from Italy and British India; hides and skins from Argentine and Brazil and other South American countries in smaller quantities; timber from the Soviet Union and Finland; rubber from British Malaya and the Netherlands East Indies; iron ores from Sweden (in largest quantities), manganese from South Africa and the Soviet Union; sulphur from Spain; bauxite from Yugoslavia and Hungary. This great diversity of imports and the world-wide areas from which they were drawn is indicative of the highly evolved and complicated structure of the German economy. And the same was true of the world-wide distribution of its manufactured products.

GERMANY'S EUROPEAN TRADE

Germany occupies an intermediate position between western or maritime Europe and eastern or continental Europe. Western Europe in this sense includes the lands which are centred on the Atlantic. The destinies of these lands lie on the seas; each state has a colonial empire; each has a large trade with its own and other tropical lands. Each has a maritime climate, which, coupled with the pressure of population, accounts for its specialization in pastoral farming. In this area lies the western end of the great coal belt. Here, too, especially in the Low Countries, converge natural land and water routes, which permitted the development of medieval industry and trade. Today Britain, Belgium and northern France are highly industrialized states. East-central Europe—eastern Poland, the Danube lands and the northern Balkans—has a relatively simple structure. These lands are dominantly agricultural; they are essentially producers of grain and natural products. They possess also certain mineral and metal resources such as oil, magnesium and copper, but are deficient in coal and iron; timber resources are drawn from the Carpathians and the Balkan uplands in Poland and Yugoslavia respectively. In northern Europe the forests which are dominant north of latitude 60° supply large exports of timber and paper pulp. Forest products are the chief exports of Finland, Sweden and Norway (80, 40 and 33 per cent of their exports respectively). Their farm lands are mainly devoted to hay and pasture, oats and flax, and, since the lands

on the Baltic shores are in a climatic sense an extension of the North Sea lowlands, surpluses of dairy produce are exported as well as flax, especially from the Baltic provinces. To the south, in Mediterranean Europe, corn, wine, olives and tropical fruits make up the chief export surpluses of these agricultural lands. These lands are notably deficient in the raw materials of industry—coal, iron and oil, and northern Italy is the only large seat of industry in the three southern peninsulas of Europe. By far the most important manufacturing industries are the iron and steel and textile industries.

Germany has dominated, or has been a chief partner in, the foreign trade of its border states. Germany lies astride maritime and east-central Europe. Her northern coastlands share the same feature of rural economy as Denmark, Holland and the Baltic states. Here, too, she has her outlets overseas through the ports of Hamburg, Bremen and Emden, although a large part of her foreign trade passes through the Low Countries; and through the Baltic ports she has contact, like Poland, with northern Europe. With the growth of industry and population she became increasingly dependent both on overseas and European markets.

It will be well to cast a glance on the general significance of Europe in the world's trade and of Germany's particular place in it. All figures are for 1937. Europe, excluding the U.S.S.R., was responsible for one-half of the value of the world's total of exports and imports. Germany was responsible for 8 per cent of the world's imports and 9.1 per cent of the world's exports, and 8.56 per cent of the world's trade, as compared with 17.18, 9.91 and 13.64 for the United Kingdom, and 10.97, 12.66 and 11.79 for the United States.

The proportion of Germany's foreign trade transacted with the United Kingdom amounted to 5.7 per cent of her imports and 7.3 per cent of her exports. Her trade with France was extremely small, amounting to 2.9 per cent of Germany's imports and 5.3 per cent of her exports.

The Low Countries (Belgium and Holland) accounted for 7.6 per cent of her imports and 12.8 per cent of her exports. Holland was her greatest single customer (7.9 per cent), a fact which clearly demonstrates the importance of Holland as a market, but particularly as an avenue of transit for German goods to overseas markets.

The Baltic states (Sweden, Norway, Finland and Denmark) took 10 per cent of Germany's imports and 12 per cent of her exports. Poland, with a population approximately equal to this group, took only 1.5 per cent of the exports and imports. Rumania, Hungary and Bulgaria took 6.7 and 5.3 per cent of her imports and exports; with Yugoslavia, this group was probably equal to the Baltic group. Switzerland, Czechoslovakia and Austria together took 6 per cent of the imports and 8.6 per cent of the exports.

The Mediterranean countries (Spain, Italy, Turkey) accounted for 8.2 per cent of her imports and 8.4 per cent of her exports.

The most striking feature of these figures is the great importance in the foreign trade of Germany of the Low Countries, especially Holland, the Scandinavian countries, and the south European countries. The first serves as an outlet overseas via the Rhine route and via rail. The second receives large quantities of goods of small bulk but high value through the great *entrepôt* port of Hamburg, which together with the Baltic ports receives timber, pulp and ore in return. Southeast Europe receives German manufactured goods, and sends in return food and minerals; this trade in particular greatly increased in the 1933-9 period, when Germany virtually acquired a monopoly of their trade.

These foreign trade relations may be expressed alternatively by taking the proportion of the trade of each group of countries that was transacted with Germany, noting, by way of comparison, the relative importance of the latter's chief competitor, the United Kingdom.

In the Baltic bloc, the United Kingdom is a chief competitor, with Germany taking a slightly greater percentage of the trade of each country, and this is also true of Latvia, Lithuania and Esthonia. The aggregate imports of six countries of southeastern Europe, that may be classed as non-industrial countries, are shown in the table below.

Contributors to the Import Trade of Six Non-industrial Countries of Southeastern Europe¹

	<i>Imports</i>	<i>Exports</i>
Germany	32.8	26.4
United Kingdom ..	7.6	8.5
United States ..	5.9	5.8
Italy.. ..	5.4	8.2
France	2.6	4.0
Austria	8.6	8.8
Czechoslovakia ..	6.4	6.0
Others	30.7	32.3
TOTAL	100.0	100.0

Germany took about 30 per cent of the entire foreign trade of Hungary and Rumania, and over 50 per cent of Bulgaria's. In each of these countries the British share of both imports and exports was between 5 and 10 per cent. In Greece, Germany enjoyed a similarly large proportion. Her trade with Bulgaria amounted to over 50 per cent of the total,

¹ The countries are Bulgaria, Greece, Hungary, Rumania, Turkey and Yugoslavia. *Review of World Trade, 1937*, League of Nations Publications.

and she dominated similarly the Turkish trade, where the British share of its exports was negligible, as compared with 10 per cent of its imports. Germany thus completely dominated the foreign trade of these small states of southeast Europe, where it competed with local products and the exports of Austria and Bohemia. The British contribution was quite negligible. The proportion of German trade increased during the Nazi trade drive of the late 'thirties, but German dominance has been the normal state of affairs over the last fifty years. In the case of the Low Countries Belgium did a little over 10 per cent of her export and import trade with Germany, and Holland a higher proportion, 21 per cent of her exports and 15 per cent of her imports. Only in Holland's exports does the British normally exceed the German share, though in the case of both Holland and Belgium the latter is considerable. Britain's share of Belgium's trade was normally much the same as that of Germany, and while Holland, though exporting large quantities of foodstuffs to Britain, is mainly oriented towards Germany on the basis largely of propinquity and its command of the Rhine mouth, Belgium is very closely tied up in its economic relation with France and Britain.

A large proportion of the foreign trade of Austria, Czechoslovakia and Switzerland, some 20 per cent or more, is normally with Germany, whereas their trade with the United Kingdom is very small. The economic orientation of these three countries with regard to their foreign trade is directed overwhelmingly northwards to the North Sea ports. The Mediterranean ports of Marseilles, Genoa and Trieste take negligible proportions of their foreign trade, for, in spite of the proximity of these ports by rail, the Alpine crossings add greatly to transport cost, whereas the North Sea ports have superior steamship connection, and are accessible, too, from Switzerland and Bohemia, by the Rhine and the Elbe. Switzerland's connections are overwhelmingly with the three northern states of Germany, France and the United Kingdom; and the United States is also a big purchaser of Swiss manufactured wares. The bulk of Swiss imports of food, cereals, coal, coke and petroleum come via the Rhine through the ports of Strasbourg, Mannheim and Basel. In total, the Swiss traffic with the Mediterranean ports, Marseilles, Genoa and Venice, totals only about a quarter of the total movement of Switzerland's foreign trade.

The orientation of Austria and Bohemia is directed largely to the Danube lands, while, economically, there is a good deal of interchange between these two and Poland, and with Italy, largely on account of the movement of coal from Upper Silesia.

This examination of the foreign trade of Germany and its bordering states in the 'thirties reveals that the countries of west-central Europe are intimately associated and interdependent, in so far as their trade is

oriented towards Germany. The trade of Germany extended far beyond its border states, however, to the non-industrial lands of Scandinavia, Poland, and southeastern Europe, in which areas she shared the trade with Britain in the first and second, and dominated that of the third. The northern states and Switzerland have close relations with Germany, especially Switzerland and Holland, but the orientation of Denmark and Belgium is dominantly westwards to Britain and France. Lastly, the southeastern border states of Switzerland, Austria and Czechoslovakia are dominantly oriented towards the German North Sea ports in their foreign overseas trade; but find markets for their manufactured goods and sources of their food supply in the Danube lands. They therefore found their chief competitor in Germany, their western neighbour.

Austria and Czechoslovakia had a large foreign trade with the Danubian lands, which, in its great importance to their national economy, clearly distinguishes them from Switzerland. There was also an active interchange between Polish Upper Silesia, Bohemia-Moravia-Silesia in Czechoslovakia, and eastern Austria. This trade centres on the exchange of coal and coke from Upper Silesia, and the iron surplus of eastern Austria, while Vienna functioned, as it did before 1914, as an *entrepôt* for Czech wares from the Danube lands. There was also a very large through traffic of coal from Polish Silesia to Italy.

The close interdependence of these three areas is a very marked feature, and the zone of population density, as of traffic movement, runs along an axis from Polish Upper Silesia, through Bohemia-Moravia and the east Alpine foreland via Vienna, thence by the main route across the Semmering Pass to north Italy.

SELECTED INTERNATIONAL COMMODITY MOVEMENTS:

COAL, COKE AND IRON

The whole of western and central Europe, as far as and including western Poland, Bohemia and Austria, has a close railroad net, so that every place is within ten miles of a railroad. To the east of this area—in eastern Poland, Slovakia and the Danube lands—railroads are fewer, and considerable areas lie further than this distance from the nearest railhead. This is one of the basic distinctions between the closely settled land of high mobility in the west and the more thinly peopled, backward lands, where, over large areas, there prevail a sustenance farm economy, little industry, and low mobility of both persons and goods. It is a main difference between West and East sections of Central Europe. But a uniform railway net and a similarity of industrial or agricultural production of neighbouring lands do not necessarily mean unity of commercial

organization. The density and direction of traffic is determined in the first place by local integration around the urban centres, and secondly, by the long-distance movement of goods.

The Rhine lands contain the chief seats of iron-ore and coal production in Europe. The Lorraine field lies to the west, in the middle basin of the Moselle. The coal-fields form an east-west belt on the northern border of the uplands, with the French-Belgian field to the west of the Cologne "Bay", and the Ruhr field, the giant of production, to the east of the river, but in direct touch with it by canal. Lorraine and the Ruhr are equal in their production of pig iron (10 million tons); but the Ruhr leads in steel production by over 50 per cent, and its finishing industries are more than double those of Lorraine. The whole of the Lorraine field produces some 50 million tons of ore, of which 20 millions are consumed in the local furnaces. Of the remainder, much is distributed throughout France. Of the exports of ore to foreign countries in the mid-'thirties, the Saar took 4.5 million tons; the industrial belt of Belgium, 10 million tons; the Nord, 3 million tons; the Ruhr, 3 million tons. The Ruhr import compares with 4.5 millions in 1913. With regard to ore, the closest link of Lorraine is with the western end of the coal belt in the Belgian Sambre-Meuse and French Flanders. But only ten per cent of the Ruhr imports come from Lorraine. The great consumption of the Ruhr is met mainly by imported ores, which come up the Rhine and, secondarily, the Dortmund-Ems canal. This reached a total of 20 million tons in 1937.¹ Sixty per cent came from Sweden.

Coke (or coking coal) is the other main item in the iron-smelting industry. The Ruhr is the giant of production, accounting for some 27.5 million tons in 1927, as compared with 4 millions in France (nearly all of which is made in the Nord), 5.5 millions in Belgium and 2 millions in the Saar. The Lorraine field consumes something in the order of 10 to 12 million tons. In 1913 the Ruhr supplied three-quarters of the lot; in 1927, a half came from the Ruhr. Belgium and Holland supplied about 1 million tons each, and Belgium, too, in spite of its own production of 6 million tons of coke, imported some 3 millions from the Ruhr, to smelt her imports of ores from Luxembourg-Lorraine. It will be clear that this enormous movement of iron, coke and coal cannot use the Rhine. Moreover, the rivers Meuse and Moselle are not navigable. The Rhine-Marne canal carries much traffic between Lorraine and the Nord. Iron ore and coke were sent via the canal route to Strasbourg, for transhipment to Rhine barges, Ruhr coal in particular being coked at this break-of-bulk point before being dispatched to Lorraine. But the greater part of this

¹ German domestic production was small but was increased by the Nazis to 11 million tons. The sources are the Sieg, Lahn and Dill valleys, and the Peine-Salzgitter district in Hanover, on the Mittelland canal, where the Göring works have been built.

traffic from Lorraine had perforce to use the railway to Belgium to the Nord, or to Strasbourg for transshipment to the Rhine.

The Ruhr coal-field and the German Lorraine iron-ore field were developed as complementary industrial areas before 1918, exchanging fuel and iron. The annexation of German Lorraine to France in 1918 gave her a bigger iron-ore production than she could digest, and an insufficiency of coking coal. The readjustments were made by importing more coke, and sending more iron to Belgium, Holland and northern France. Between the wars, on the other hand, the Ruhr reduced its imports of Lorraine ore. There has developed, in other words, closer collaboration between the coal-fields and ore-fields in the Low Countries and in France. The Ruhr, on the other hand, was obliged to turn to greater imports of foreign supplies. But there is an essential economic dependence of all these seats of coal production on the iron-ore field of Lorraine, an interdependence which cannot be thwarted by tariff barriers.

With respect then to the long-distance movement of commodities from one industrial area to another—and here the two chief single commodities are coal and iron—and to and from the overseas ports, we would specially emphasize the essential economic unity and interdependence of the whole of the Rhine lands. This includes the Low Countries, western Germany, eastern France—the Nord and Pas de Calais, and Alsace and Lorraine. The medium of this traffic is the Rhine river and its navigable tributaries, and interconnecting canals, and the network of railways. The river is, in effect, an extension of the sea as far as Strasbourg, and its ports function as feeders for the railways in their vicinity. Moreover, the Rhine is flanked to the east and west by the greatest industrial areas in Europe. Duisburg-Ruhrort alone handles one-third of all the inland water traffic of Germany (20 million tons), importing vast quantities of ore, grain and petroleum up the Rhine, and sending out coal, both up and down stream. Mannheim-Ludwigshafen handles about 7·5 million tons. In the middle Rhine lands, the four chief ports are Mainz, Mannheim-Ludwigshafen, Strasbourg-Kehl and, very much smaller than the rest, Basel. Mannheim and Strasbourg each serve distinct hinterlands, southwest Germany and Alsace-Lorraine respectively. In addition, however, they both supply Switzerland by rail with its bulky imports of coal and cereals. There is also a growing traffic from Strasbourg to Basel by the Rhine-Rhône canal, so that Basel serves as an important distribution centre for northern Switzerland. (It imported 1·7 million tons in 1933; whereas in 1914 the figure was only 70,000 tons.) Through these three ports, then, Switzerland receives the greater part of her coal, wheat and petrol.

GERMAN COAL IN INTERNATIONAL TRADE

We may turn, in conclusion, to a more specific consideration of the role of coal in the foreign trade of Germany and its neighbouring countries. International trade in coal is of basic significance to the economies of the states of western and central Europe, and its revival to the pre-war level, adjusted to the new situation brought about by changes in political frontiers, is one of the most urgent problems of contemporary Europe in which western Germany must inevitably play a major role. Let us glance at the geographical aspect of this situation.

Europe outside Russia consumed in pre-war years nearly 300 million tons of hard coal and 220 million tons of soft or brown coal, 40 to 50 million tons of fuel wood, 8 million tons of petroleum (including 7 millions from Rumania), 9 million tons of imported oils, 1·8 million tons of natural gasoline from European wells and 2·4 million tons from overseas, and 600,000 tons of benzol from coke ovens and 3 million tons of synthetic gasoline from coal. Two-thirds of the electric energy consumed was derived from coal. In the post-war situation western Europe is virtually cut off from supplies of coal, oil and wood in Europe east of the "iron curtain" from Lübeck to Trieste, so that it is dependent on its own resources.

As we have seen in the introductory paragraphs, coal resources are unevenly distributed and the countries of northern Europe, Mediterranean Europe and Danubian Europe depend largely on imported supplies of coal or on other sources of power, the chief of these in northern and southern Europe being hydro-electric power. The export market in coal is dominated throughout Europe by its four main fields. The fields of Britain are so close together and so near the sea and so far affected by common conditions that they may be regarded as a group, although in fact the South Wales and the Northumberland-Durham fields are the two chief exporters. Britain produced in 1937 an aggregate of 240 million tons. The Ruhr field of northwestern Germany produced in 1937 128 million tons. The Upper Silesian field produced a total of some 80 million tons, two-thirds of which total production was in Polish territory between the wars, the remainder being in Germany and Czechoslovakia. It produced in aggregate not far less than the Ruhr, and is an equal potential producer. The fourth main field is the Donetz field in the Ukraine of Russia. The fourth and third do not enter into the markets of western Europe. The German Silesian field marketed some of its coal in eastern Germany and the Czechoslovak sector still finds a market in Czechoslovakia. But between the wars the bulk of the coal production in the Polish field was marketed in Poland and in Danubian Europe, and Poland was so far embarrassed by surplus supplies that

there was a large export through Gdynia to the Scandinavian countries. In 1947 Poland produced 64 million tons, of which 20 million tons were exported, the bulk of it to Scandinavia. She is now also in possession of the German sector with a production of some 20 million tons.

In studying the coal situation in western Europe we are in effect, therefore, concerned with the export of coal from Britain and from the Ruhr field of Germany. In 1913, Britain exported about 73 million tons of coal plus 3 million tons of coke. Sixty million tons were dispatched to Europe and the Mediterranean. These supplies reached the European mainland through the Continental ports. Germany exported 45 million tons, the great bulk of which obviously came from the Ruhr and moved by the Rhine and by canal and by rail. British coal, however, was able to compete in Hamburg, and even in Berlin, with coal brought all the way from either the Ruhr or Silesia. Thus, Germany imported in this year 9 million tons from Britain. Thus, in 1913, two-thirds of the European coal deficit was supplied by Britain and one-third by Germany. The German supplies were distributed by river, canal and by rail and dominated the Continental markets, whereas the British supplies penetrated from the ports inwards, as is well illustrated in the case of northern Germany just noted. At this time, too, it should be recalled that half of the Lorraine iron ores belonged to Germany, and the big export of coal and coke thither from the Ruhr does not figure in these international statistics. At this time, the Baltic states imported 15-16 million tons and most of this came from Britain. France imported 20 million tons and 4 million tons of coke, and of this 13 million tons of coal came from Britain through its ports, while the rest came from Germany (and a small quantity from Belgium), mainly by rail. Austria-Hungary imported 14 million tons, that included 1 million tons of British coal through Trieste, the rest being derived from Silesia, which found its undisputed market in these Danubian lands. Italy imported 8-10 million tons, all of which came from Britain, and Holland 8 million tons, almost all of which came down the Rhine from the Ruhr.¹

We may next look at the position in 1937 on the eve of World War II.² The position after World War I was in some ways similar to the present post-war situation, in that markets and supplies were temporarily disrupted. The British fields were then able to export again (though in smaller quantities) and the German exports soon revived. But the temporary vacuum was filled, as is the case today, by the export of coal from Pennsylvania via a long railway haul of several hundred miles to the American Atlantic ports and thence across the Atlantic, a movement that

¹ A. J. Sargent, *Coal in International Trade*, London, 1918.

² See *The Mineral Industry*, 1941, Vol. 50 (McGraw Hill, New York), and L. Dudley Stamp, "Britain's Coal Crisis", *Geographical Review*, April 1948.

was able to take advantage of the inflated prices in Europe that were due to the scarcity of British and German coal in the early 'twenties.

The situation in 1937 was that Britain exported 52 million tons of coal, of which 12 millions was bunker coal; in other words, about 40 million tons went to Europe, as compared with 60 million tons in 1913. This compared with an export of 38.6 million tons from Germany, 11 million tons from Polish Silesia and 6.3 million tons from the Netherlands. The exports of Britain and Germany to European countries in this year may be summed up as follows:

Exports of Britain and Germany

<i>Britain (1938)</i> (in thousands of long tons)	<i>Germany (1937)</i> (in thousands of metric tons)	
U.S.S.R. and Suc- cession States 1.86	Finland .. 0.180	Algeria .. 8.040
Sweden .. 2.65	Latvia .. 0.120	Switzerland .. 0.475
Norway .. 1.37	Lithuania .. 0.300	Yugoslavia .. 0.449
Denmark .. 3.00	Czechoslovakia 0.648	Sweden .. 0.631
Netherlands .. 0.89	Poland and Danzig .. 1.107	Norway .. 0.305
Belgium .. 0.66	Netherlands .. 6.834	Denmark .. 0.594*
France .. 6.15	Belgium- Luxembourg 0.169	Portugal .. 0.316
Portugal .. 0.71	Hungary .. 0.980	Spain .. 0.703
Spain .. 1.00	Austria .. 0.543	Italy .. 7.930
Italy .. 2.26	France .. 5.380	Greece .. 0.613
Greece.. .. 0.14		
TOTAL .. 36.0		TOTAL .. 38.6

*1938.

From L. Dudley Stamp, "Britain's Coal Crisis", *Geographical Review*, April 1948. The long ton contains 2,240 lb. and the metric ton 2,204.6 lb.

The critical nature of the situation since 1945 will be apparent from these figures. British coal exports have temporarily gone. This export trade was the foundation of Britain's economic development and the basis of its economic life as developed during the nineteenth century. This means also that the European countries dependent on these British coal supplies are lacking in the basis of their economic life. This situation is made even more serious by the fact that the coal exports from the Ruhr were reduced to nil after 1945, so that the Continental countries were also deprived of their German sources of coal. Production of coal in Britain reached 220 million tons in 1947 with exports virtually nil (less than 1 million tons); although the production goal for 1948 was 236 million tons with an export of 11 million tons, this is still well under a third of the pre-war export.

Coal Imports into Western Europe (in thousands of metric tons)(Source: "Coal in Europe", *World Affairs*, March 1948, p. 115)

<i>Country</i>	<i>Pre-war Monthly Average, 1935-8</i>	<i>Current Imports Average Monthly by E.C.O. (Jan.-March 1948)</i>	<i>Per cent of Pre-war Average</i>
France	1,997	1,756	88
Belgium	525	534	102
Netherlands ..	702	429	61
Norway	255	176	69
Denmark	473	367	78
Sweden	654	507	78
Italy.. .. .	1,099	805	73
Luxemburg ..	254	209	82
Switzerland ..	273	156	57
Other Countries ..	687	421	61
TOTAL ..	6,919	5,358	77

In 1947 Germany produced 94 million tons (with an additional 174 million tons of lignite, as compared with the 1937 output of 184 million tons of lignite). The exports of coal from Germany in the same year amounted to 13.2 million tons (excluding, of course, Upper Silesia that now lies in Poland), as compared with the pre-war total of nearly 40 million tons (1950, 16 m.). Hence the plight of the coal importers, such as France in particular, whose dearth of coal is always a national economic problem, as well as Italy and the small states on Germany's frontiers. The situation in Scandinavia is relieved by the import of coal from Poland. The economic existence of these western countries depends upon their coal imports. The gap is in some measure being again met by supplies from the United States, but this is obviously not a permanent solution to the problem. About 40 million tons from the United States were needed in Europe in 1948, although, according to the Marshall Plan of the sixteen participating countries, this was to be progressively reduced, as European production increased, to only 6 million tons in 1951. The revival of Europe depends upon the resumption of exports of coal from Britain and western Germany, and this means in Germany, the Ruhr, that has now wellnigh a monopoly of German production.

TRADE IN AGRICULTURAL PRODUCE

Cereals, dairy products and meat together with animal feedstuffs are indispensable imports to Germany in order to supplement home production. These imports were greatest in the late 'twenties when Germany shared in the general improvement of world trade, and when it was still in process of reinstating its agriculture and replenishing its depleted stock. In the 'thirties, however, the import of these products greatly decreased, partly as a result of the depression and the shortage of foreign exchange, but, especially as concerns meat supplies, as a deliberate policy to keep out foreign meat and increase home production. In years of good harvest, Germany's wheat crop, together with rye, is sufficient to meet the home demand. Germany's import of cereals thus varies considerably according to the home harvest, and in time of good years she could in the aggregate almost dispense with imports. On the average she imported about a quarter of her total consumption of wheat. In rye she is virtually self-sufficing. Her imports of dairy produce show a steady increase over the past fifty years. In 1928-31 she imported about 20 per cent of her consumption of dairy produce, and over a third of her eggs. During the 'twenties she imported large quantities of pork and beef, the two chief items of German meat diet (consumption of mutton being quite negligible). Both meat and slaughter cattle were imported in the 'twenties, since her own stocks and production had not recovered from the havoc wrought by World War I. By 1930, the 1913 level had been attained, stocks replenished, breeds improved, and the production of fodder increased. In order still further to increase home production, and partly owing to general world conditions during the depression and the lack of foreign exchange, this development was further encouraged by the re-erection of the custom tariff against imported meats.

Thus, imports were at their peak in the 'twenties and decreased in the early 'thirties. But in spite of the decreased import of meats, there was no diminution in consumption per head of the population. Home production went far to fill the gap, a fact which is found in other importing European countries in the same period. This was effected in part by the increased production of domestic grasses and pastures, but also, what is more significant, by the import of feedstuffs. Though these imports also decreased in the early 'thirties such diminution is only possible in good fodder years, as the experience of the dry year of 1935 amply proved, when domestic meat supplies ran short. Thus to increase the numbers of livestock for breeding and the quantities of animal products by increasing the fodder grown on the farm has been a main objective of the policy of national production. This was a keynote of Nazi policy in the last decade.

Nevertheless during the quinquennium 1935-40 there was no diminution in the imports of foodstuffs and feedstuffs, but rather an increase—from 7,200 million tons in 1933 to 8,600 million tons in 1937. The fight for autarchy in meat and dairy products was effected by the general increase in the production of the soil by the improvement of agricultural techniques. This trend must undoubtedly be continued in the new Western Germany.

PART V

NATION AND STATE

*Deutschland, Deutschland über alles,
Über alles in der Welt,
Wenn es stets zu Schutz und Trutz brüderlich zusammenhält,
Von der Maas bis an die Memel,
Von der Etsch bis an den Belt.*

Von Fallersleben (1848).

CHAPTER 13

THE POLITICO-CULTURAL GROUPS OF THE GERMAN PEOPLES

THE UNITY OF THE GERMAN LANDS

THE CONCEPT of an area in the heart of Europe occupied and united by the language, culture, and politico-historical development of the German-speaking peoples, has permeated German thought for many years. It received special attention during the early decades of the nineteenth century, at a time when Metternich referred to Deutschland as nothing more than "a mere geographic expression". It was involved in the growth of nationalism in the nineteenth century, and then again by scholars during the past fifty years. Especially since 1918, and more so during the Nazi period, this wide area, irrespective of political frontiers, was often described as Deutschland. The German protagonists claimed that they used the term purely as an expression of the cultural unity of the German-speaking peoples, but, when this became associated with dreams of territorial expansion under the Nazis, the whole concept became thoroughly distasteful to such as the Swiss, Dutch and Flemings, who came within its ban. Viewed from a scientific point of view, there is here a baffling problem of geographic synthesis. French geographers write with eloquent persuasion of the personality of France as a man-made, not a nature-given, unit. How can we answer this question in the case of Deutschland? Deutschland may well be *ein Stück Boden und ein Stück Menschheit*, but what does this mean in fact?

The name *Deutschland*, which literally means *German land*, was used in a political sense after 1815 as the alternative name of the German Confederation (*Deutsches Bund*), and in 1871 it became the official alternative title of the *Deutsches Reich*. But it has been used for centuries to designate the wider area of the German-speaking peoples, and of the alien peoples who, in the past, have been greatly influenced by German culture. It was used for centuries in this cultural sense only, and particularly during the Humanist Movement in the sixteenth century.

After the Treaty of Westphalia (1648), with the recognition of the independence of the nation-states of the United Provinces and Switzerland, the advance of France to the Rhine, and the political disintegration of the German peoples, the cultural concept of Deutschland gradually faded into oblivion. At the opening of the nineteenth century, when the German Confederation was established, the idea of the cultural

unity of the German peoples was dead among the common people. It was revived by the intellectual *élite* as a part of the Romantic Movement, comparable in some ways with the Humanist Movement of the Renaissance period. This later movement stressed the new idea of nationality. Contemporary German philosophers maintained that the keystone of national unity was language. According to Fichte, the leader of this movement, language "gives unity to an inseparable whole, and is more important in the existence of a State than natural frontiers".¹ In 1810 the term *Deutsche Volkstum* appears for the first time, and *Volk* was regarded as the equivalent of nationality. It was not until later, and even then among only a few German scholars, that it was realized that nationality is moulded by conditions far more intangible than speech. In 1834, with the advance of cartography, there appeared the first map of the distribution of the Germanic languages; it bears the significant title *Nationalitätskarte Deutschlands*. At the same time, scholars were beginning to regard the wider Deutschland as a physico-geographical entity, though let it be remembered—and this applies to linguistic as well as to other distributions—that map-making was not yet accurate, nor were the physical sciences far advanced, and such ideas were necessarily crudely descriptive. In the early decades of the century, Carl Ritter and his followers regarded Deutschland as a natural entity, composed of the Alps, *Mittelgebirge*, and the Northern Lowlands. Many writers have since referred to these as *Ober-, Mittel- and Niederdeutschland*. This idea of the threefold composition of the German lands, in its physical build, no less than in languages, culture and historical development, found general acceptance in the early nineteenth century. The idea, for example, was elaborated by Wilhelm Riehl (1854), who wrote of the *Völker und Ländertrias*—of a "socially centralized north", which was dominated by Prussia; a decentralized or more fragmented *Mitteldeutschland*, which included Saxony, Thuringia, Hesse, Baden, Württemberg, the Bavarian Palatinate, and Northern Franconia; and a "centralized south", to which belonged most of Bavaria and the German-speaking lands of Austria.²

Since 1871, the advancement of science and of cartography has made possible more exact analysis and cartographical representation of the geographical areas embraced by these various aspects of Deutschland. In 1871, the term Deutschland was applied to the Reich as its official title, but, in deference to the susceptibilities of neighbouring peoples and governments beyond the Reich, it was usually avoided for the

¹ Emil Meynen, *Deutschland und Das Deutsche Reich*, 1935, p. 40. Meynen's work is not politically tendentious. It is a scholarly effort to cope with this whole question. What else could one expect of a disciple of Penck, to whom the book is dedicated? The work, however, is, naively nationalistic.

² Quoted by Meynen, *op. cit.*, p. 205.

wider area. Thus a new term had to be found, and *Mittleuropa* was used as a substitute. This latter title has been adhered to by most German geographers to this day, although, to distinguish it from the larger entity of which it forms a part, the name *Germanische Mittleuropa* or German Central Europe is often used. Nevertheless, the similarity of title has given rise to much confusion, and some German geographers have even refused to accept the name *Mittleuropa* for the wider area of Central Europe.

After the First World War the Pan-German idea again began to receive special attention. The term Deutschland began to be used by scholars and propagandists alike, and its meaning from various points of view was more fully elaborated. It is not surprising that Nazi politics brought forth much writing, blatantly opportunist, on the subject the geographical unity of Deutschland. We may, however, refer to the works of two outstanding geographers for as clear a statement as is possible on varied aspects of the concept of Deutschland.

Norbert Krebs, the pupil and successor of Albrecht Penck to the Chair of Geography in the University of Berlin, gave special attention to this question in the 'thirties. But we find again a change in terms, for the magnificent German atlas, prepared under the direction of Krebs, bears the title *Das Deutsche Lebensraum in Mittleuropa*. The *Deutsche Lebensraum* is here regarded as the compact area of German settlement and of the German-speaking peoples, together with the areas occupied by alien peoples, who in the past have been strongly associated with German culture (Fig. 1). This conception is exactly in line with the views expressed by his predecessors. In the introduction to the atlas, Krebs writes as follows:

"*Volk* and *Lebensraum* stand in the closest inter-relationship. The land area (*Raum*) carries traits imprinted on it by the labour of an active people through centuries; but it has also influenced the men who inhabit it. No *Volk* can be truly understood without a knowledge of its *Lebensraum*. This is true for our German *Volk* as for every other. But the attempt to clarify the relations between *Volk* and *Raum* would not succeed if we limited our view to one of the States in which the German people live (namely the *Reich*). The area which the Germans have transformed through their assiduous labour, and from which they have created a humanized landscape (*Kulturlandschaft*) with a character of its own, is more extensive than the *Reich*. More than in the case of other peoples, it is necessary for ours to embrace the whole German Folk Area (*Volksgebiet*) and to see how it is embedded amongst other peoples and lands.

"We have deliberately tried to portray [*in the atlas*] the area occupied by the German-speaking peoples within the framework of its neighbouring lands. The maps embrace nineteen modern States, fifteen of which are included in some measure in the compact German Folk Area (*Volksboden*). They extend from Flanders to Memelland, from Schleswig to the southern Tyrol. They

show the historical Deutschland in contact with three seas and with a wide geographical connection with France and Poland. The western and eastern borders exhibit varied and conflicting relationships. The main emphasis is given to the centre. In this way we embrace an area which is unified by a common culture and language."

There is yet another aspect to the question. It has often been claimed by German geographers that there is a "natural entity" in the heart of Europe which frames the German-speaking peoples, though its limits do not always coincide with the latter. Thus Albrecht Penck wrote:

"Deutschland is for us a natural entity (*eine natürliche Einheit*) and not simply a political conception; such a one is the *Deutsches Reich*. This latter is the State with its frontiers, which unfortunately do not embrace all those who would belong to it. *Deutschland*, however, is also not the land in which German only is spoken. It stretches from early times beyond the limits of the German speech (*Sprachboden*), and does not coincide with the latter. What *Deutschland* has meant for centuries is a definite part of the earth's surface, with characteristic features, and a distinct form (*Gestalt*)."¹

This view of Penck is re-echoed by his pupil, Krebs, who writes:

"*Deutschland* is for us neither a pure physical, nor a pure ethnic (*völkischer*) conception; and it certainly does not coincide with the changing area on the political map. It is, as the name indicates, the land which belongs to the Germans on the basis of all the physical and cultural peculiarities of the area. *Deutschland* is greater and more stable than the *Deutsche Reich*; but also its area is not unalterable for all times."

In defining this so-called "natural unit", Penck refers to the maximum extent of the first Reich at the end of the Middle Ages—the historical Deutschland. It was characterized by the threefold combination, the *Dreiklang*, of Alps, Uplands, and Lowland, and where one of these dies out to east or west, there this natural unit comes to an end. To the north, it merges into the peninsula of Denmark and to the south, on the southern slopes of the Alps, it is demarcated by the approach to Mediterranean climatic conditions. This is a vague concept, though it has often been repeated from Ritter onwards, the area ranging in extreme cases from the Pyrenees to the Pripet marshes. The fact is that the idea of such a "natural unit" *per se* only acquires meaning when defined in terms of the human traits of the State, culture, and speech. And a natural unit cannot be defined in terms of a cultural unit.

It will be clear that there is great variety in the potency and the geographical extent of the various criteria upon which these conceptions are based. Moreover, all the human criteria noted above are frankly historical. The lack of geographical coincidence between the areas of German speech, German nationality, and the Reich (first, second, and

¹ Penck, 1925. See quotation in Meynen, *op. cit.*, p. 208.

third!) in the past as well as in the present, the fluctuation of each of these areas in history, and the flimsiness of some of the arguments upon which these various areas are defined, make the definition of a composite Deutschland as a meaningful politico-cultural entity an impossibility. This theme fully bears out the view of George Kimble that to "spend our days 'regionalizing' is to chase a phantom, and to be kept continually out of breath for our pains".¹ The phantom in this case is Deutschland.

The geographic concept of the German realm varies widely according to the criteria and according to the period to which they apply. The *Reichsboden* refers primarily to the extent of the first Reich and to the frontiers that grew out of it. Its fluctuating boundaries—as well as the permanence of certain of them—are discussed below. The *Volksboden*, in effect, includes the lands occupied by the German-speaking peoples who use High German as their medium of contact with the outside world. The *Kulturboden* is a still vaguer concept, since it refers to the imprint of the distinctively German ethnic traits on the changing aspect of the landscape or habitat in which they live—field, house, village, and town. German writers have often referred to the distinct traits of the German "way of life", by which they mean cleanliness and homeliness of the peasantry, a highly developed sense of municipal life that dates from the Middle Ages, a keen sense for the "organization of area", whether it be the running of a farm, the protection of Nature, or the organization of the State. In seeking yardsticks, we are brought down by them to consider the absence of billboards, the presence of flower-pots, and the frequency of water-closets as evidences of this folk character. This is a *reductio ad absurdum*. While the German lands stand out in these respects from the lands of east-central Europe, there is no meaningful difference in material achievements between Germans and the other west European peoples.

The concept of this *Kulturboden*, or the area affected by German *Kultur*, was first outlined by Albrecht Penck and has been elaborated by Emil Meynen. Maps appear in many pre-Nazi texts and atlases. The criteria on which it is based are vague, but evidently mainly historical. The *Kulturboden* falls into four parts. First, there is the German ethnic area (*Volksboden*), as shown on Fig. 1, p. 4. This includes the fragmented areas in central Europe that have now been virtually eliminated. Second, there are the small non-German groups like the Wends, Kassubes, Masurians, Ladins, and Romansch, who accepted High German speech as their cultural medium. Third, there are the peripheral areas, whose peoples have a Germanic speech but who have acquired distinct ethnic and cultural character through centuries of

¹ George H. T. Kimble, "The Inadequacy of the Regional Concept", in *London Essays in Geography*, ed. by W. Stamp and Wooldridge, 1951.

national independence. Such are the Dutch, the Flemings of north Belgium, and the German Swiss. Fourth, there are the areas beyond the *Volksboden* that have non-German populations but, through centuries of contact with the German realm, have acquired many of its cultural characteristics. These lands lie mainly in east-central Europe. They include the Slav lands of Posen, Upper Silesia, Bohemia and Moravia, patches in Slovakia, western Hungary east to the river Raab, and Slovenia in northwest Yugoslavia. To the west, two areas are apparently included—French-speaking Lorraine and the French-speaking area of southern Switzerland. This is a moderate statement of the case. The Sydow-Wagner *Methodischer Schul-Atlas*, an excellent standard German school atlas, includes Esthonia and Latvia to the east. It also shows the area of the Austro-Hungarian Empire, which “for a century was under German domination”; the area in which, in the past, German was the language of commerce (east to a line from Leningrad to Odessa); and the eastern limit of German medieval town law, that reaches from Narva south to the Danube.

Many of these concepts and statements are sound as items in an ethnic and cultural pattern. This is part of the method and purpose of cultural anthropology and we have to recognize the valuable work that many scholars have done in this field. The confusion arises from the association of these cultural phenomena with political aspirations. It arises also from the obsession of German thinkers and statesmen for over a hundred years with the idea of the essential cultural unity of the German peoples and the need for effecting some kind of political unity among them all. It fails to recognize the separate political attitudes of many of the groups within the whole, both on its periphery and within the third Reich itself.

We have to recognize the fact, however, that the geographic pattern of distributions and relations of the German peoples is one of great complexity, the more so since the sectors of the modern Germany have retained their political independence within the framework of a federal Reich, until they were reduced to the status of provinces under the Hitler regime. With the defeat of Germany, and the rolling back of its eastern frontiers of settlement, and the liquidation of the German islands throughout east-central Europe, this whole theme may strike one as of historic importance only. The German realm, however vague its limits, expresses a reality in the historic development of Europe and in the memories of its peoples, for good and evil, and it would be naïve indeed to assume, through our own ethnocentrism, that these ideas, in their best manifestations—like the German memories of overseas opportunities—are dead. Such realities and aspirations must somehow be directed into new channels and new solutions. And it is extremely

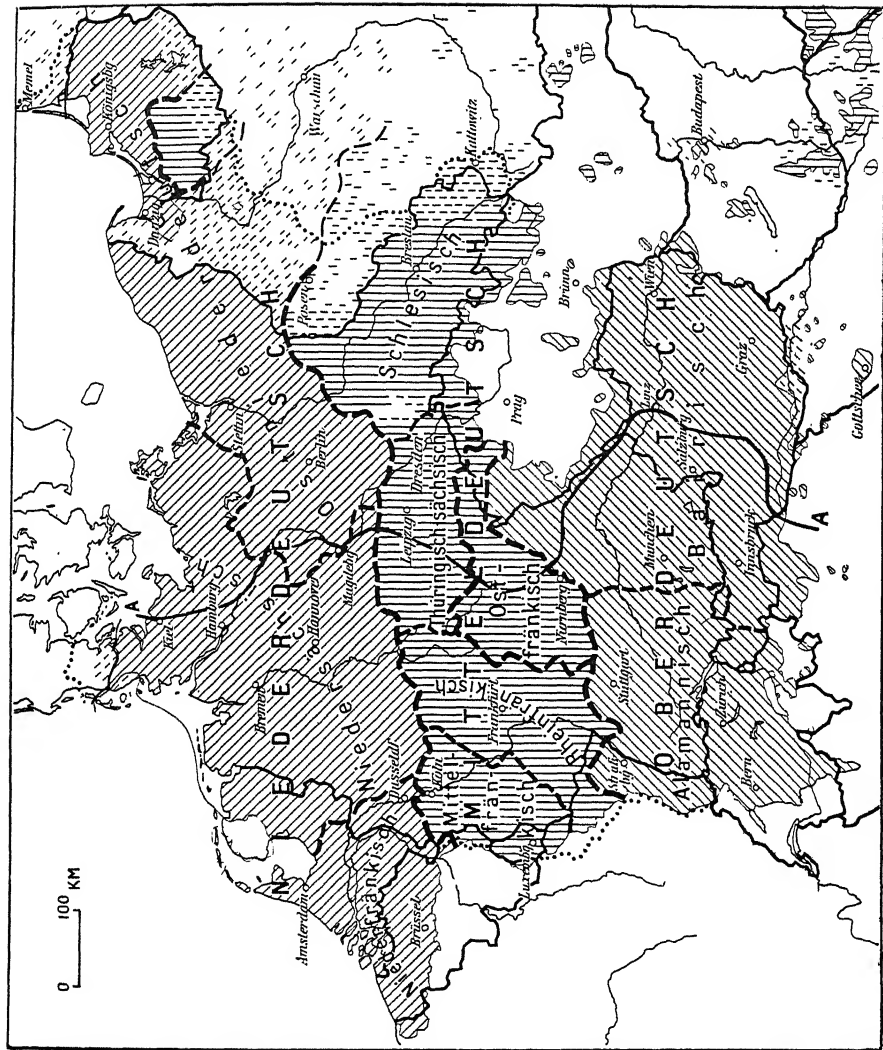
doubtful in the long run whether the rolling back of the frontiers of German settlement to the Oder and the Neisse is one of these.

ETHNIC CHARACTER OF THE GERMAN PEOPLES: LANGUAGE

The Germanic or Teutonic peoples emerged as a distinct ethnic group with a distinct language in the southern portion of the Baltic area in the late Iron Age. Their racial type was a variant of the pure Nordic; their language a branch of the Indo-European tongues, the Teutonic languages, which have given birth to the English, Frisian and German languages. The west Germanic tribes—the Franks, Alemanni, Saxons, Frisians, Thuringians and Bavarians—all belonged to this Nordic type, and spoke variants of the same tongue. From an area of dispersion which seems to have been in the lower Elbe area, these tribes moved slowly westwards and intermixed with the native populations.

The languages of the Germanic tribes seem to have been differentiated at an early date into what became in the Middle Ages Low German and High German. The former was the result of sound-shifts in German speech which appeared as early as the sixth century, due it would seem to contact with peoples of Celtic and Roman speech in the Rhinelands. The Alemanni and the Franks had long contact with the Romanized lands on the Rhineland, and there is evidence that at an early date they lost something of their Nordic character; both absorbed much of Roman-Christian culture, and became the carriers of that culture to the pagan Germanic tribes to the east of them. It would seem to be out of such associations that these early linguistic changes took place between A.D. 500 and 700. These changes affected first the tongue of the Alemanni and the Bavarians, but the speech of the Saxon tribes to the north was not affected. Thus there developed the main contrast in German speech between High German and Low German, with an intermediate form known as Middle German which received some of the linguistic changes of High German and forms geographically a belt intermediate between High and Low German. These dialects assumed definite form in the early Middle Ages, and later spread considerably both in west Germany and eastwards into the colonized lands.

The distribution of the German language into dialects is shown in Fig. 51. Frisian speech is preserved in the province of Friesland in northern Holland, in the West Frisian islands and the west coast of Schleswig-Holstein, whither it has retreated with the advance of Low German from the traditional habitat of the Frisians on the mainland. Low German is spoken throughout the lowlands of north Germany and in east Holland from the shores of the Zuider Zee to the lower Elbe, and in Schleswig-Holstein and Mecklenburg; while east of this limit it



A-A is the eastern limit
of German settlement
about 900 A.D.

Niederdeutsch
= Low German
Mittelddeutsch
= Middle German
Oberdeutsch
= High German

FIG. 51—CENTRAL EUROPE: THE DISTRIBUTION OF GERMAN DIALECTS
(pre-war) (from E. Meynen) (scale, 1 : 10 m.)

was extended, with modifications, eastwards into the colonized lands of Pomerania and East Prussia. Its southern boundary does not correspond with the junction of lowlands and uplands, as is often stated, but includes the northern zone of uplands from the Sauerland to the Harz. Just as Frisian has retreated before Low German, so the latter has in turn been gradually displaced northwards by High German. This has occurred mainly on the great routeways of the Rhine, where it has spread northwards, even to affect the speech of Cologne, and the Elbe-Saale, where it has spread north almost as far as Magdeburg. The language of the Netherlands has developed from a distinct branch of the Low Frankish dialect. But through the development of its own national language and culture, the boundary between Holland and Germany, which was not fixed until the sixteenth century, has developed into an effective linguistic and cultural divide, although the peoples on either side of it speak dialects which are closely related.

Middle German dialects are spoken from the western limits of German speech south of the Low German area, and south to a line from Karlsruhe to the northeastern corner of the Czech-speaking lands. The wooded Thuringian uplands divide the Frankish dialects to the west from the Thuringian and Silesian dialects to the east. Each of these dialects is spoken in the corresponding areas of German speech in the Bohemian uplands. The Frankish dialects in the west fall into three groups, those of the Rhineland Massif north of Bonn; those of Hesse and the Palatinate; and East Frankish, closely akin to High German, in the upper Main basin.

High German is spoken throughout the south, and includes three groups, the Alemannic, Bavarian and Austrian dialects, the last being derived from the Bavarian speech of its medieval colonizers. It will be noted that the Bavarian speech extends to the Lech and the Enns rivers.

The cultural individuality of a people is far more clearly defined by its literary language than by its vernacular tongue. Distinct national literary languages developed mainly after the innovation of printing, in the sixteenth century. The national tongue then began to displace Latin as the language of court, cleric and scholar, and as the vehicle of commercial and literary intercourse. It was then that the written languages of the great nation groups of Europe took definite form. In the nineteenth century, with the development of nationalism among the smaller peoples, vernaculars have been raised to literary status. But usually small and primitive groups do not have their own literary languages, and culturally, as well as economically and politically, are dependent upon a larger culture group or state, the language of which they may accept voluntarily or by compulsion.

High German began to come into general use as the common literary language of the German peoples after about 1500, and it was gradually

superposed on the dialects as the *lingua franca* of speech and print. For the differences between the dialects became ever more marked during the Middle Ages and after, so that today it is often impossible for a native of the north to understand one from the south. By the fourteenth century German was displacing Latin in public documents and gradually the Imperial Chancery in Prague evolved a German language for its documents that consisted of a blend of Bavarian-Austrian and Upper Saxon, that was copied by the other German State Chanceries. It was this language that was carefully standardized and popularized by Luther in his translation of the Bible. The language spread more quickly in the Protestant states of the north than in the Catholic states of the south, and it was not until the late eighteenth century that it was generally accepted as the common language of the German peoples.

It is on the basis of High German as the language of culture and commerce that German scholars have defined the extent of the German *Sprachboden*, and this they assume to be the same as the *Volksboden*. This area of High German is considerably different from the distribution of dialects. High German is used by the small Wendish group in Lusatia as well as the Frisians of northern Germany and western Schleswig. The latter are included in the area of German culture, just as their western counterparts in Holland, are included in which country they are situated and with which they are nationally affiliated. Similarly the small Romansch and Latin-speaking groups in Switzerland and Austria use High German, and so are included in the German speech area. On the other hand, the Dutch and Flemings, though speaking languages which are closely akin to Low German, have developed their own literary languages, and Holland has enjoyed three centuries of national independence, while the Flemings form a part of Belgium where bilingualism is recognized. Similar independent national folk areas surrounding the German-speaking peoples are the French, Italian, Slovene, Czech, Polish and Danish lands.

RACIAL CHARACTERS

The question of ethnic or racial characters and types, and their distribution, is so complex that we shall quote from two recent standard authorities on the subject.

"The ethnic character of the peoples of Germany is due to the age-long intermixture of Nordic and Alpine stocks. In northwestern Germany, Schleswig-Holstein, Hanover and Westphalia, the physical characters of the population approximate to those of Scandinavia and especially resemble the mixed type encountered in Denmark. East of the Elbe, Nordic features become less common and less pronounced and skulls become broader. In the south, Baden, Württemberg and Bavaria carry

a definitely round-headed population, essentially Eurasiatic (*Alpine*) in physique. A line drawn from Breslau in the east through Dresden and the city of Hanover to Cologne, so as to divide the uplands from the plains, comes close to dividing the two main population groups, the especially Eurasiatic (*Alpine*) and the typically Nordic."¹ To the west, this line may be continued to the western edge of the Flanders lowland, for the Flemings are dominantly Nordic, and the Walloons south of this line are Alpine.

The Nordic character of the original Germanic tribes has been greatly modified, both in the Northern Lowlands, where these traits are still dominant, and in the Southern Uplands, where we find today a dominantly broad-headed population with, however, fairly tall stature and light pigmentation (passing to brunette in the south) due to Nordic influence. But the broad contrast noted above between north and south should not be taken too literally; for in the Rhinelands, islands of Nordic long-headedness and stature seem to have been better preserved. Thus racial types have greatly altered since the original settlement, and "the temporary ascendancy of North German Nordics in the west of Germany during the centuries which followed the settlement of the West Germanic tribes was not of long duration".²

It would seem, however, that there is a certain correspondence between the distribution of racial traits of the living population and of the tribal areas in which the types have evolved through centuries. The Nordic type is found in north Germany mainly among the people of Frisian and Low German speech—the area roughly corresponding to the area of Saxon and Frisian tribal settlement. It is, however, a variant of the pure Nordic that occurs in Scandinavia, the Baltic states, and England and Scotland. True Nordic long-heads are found in Hesse, "old Frankish country", as Coon rightly describes it; and in Baden and Switzerland, in old Alemannic territory. The Bavarian is a typical Alpine. In southeastern Germany, from Saxony to Silesia, the head form is broad, but pigmentation is light, owing to intermixture between the immigrant Iron Age Nordics and Alpine native stock. East of the Oder appear definitely Slav types, "a broad-faced, snub-nosed, brachycephalic strain", as described by Coon. In the Baltic coast provinces this Slav type has intermixed with Nordics to form the East Baltic type, which is well represented by the Junker class, and notably by Hindenburg. In the Tyrol, the Dinaric type, which is characteristic of the mountainous land eastwards from Switzerland, has been preserved intact since the Bronze Age: the distinctive feature of this type is that it is tall and broad-headed with a flattened occiput. Definitely Nordic types prevail in

¹ Huxley, Haddon and Carr Saunders, *We Europeans*, Pelican Book, 1939, p. 188.

² Coon, *The Races of Europe*, p. 538.

central Austria, probably as descendants from the Iron Age Nordics, who developed the Halstatt culture in this region.

RELIGION

The great religious schism which occurred during the Reformation period introduced a very potent factor of cultural differentiation in the lands north of the Alps. The distribution of Roman Catholicism and Protestantism which then took definite shape has changed little since.

The first bishoprics were established during the Roman period on the site of Roman *castra* in the Rhinelands. (Fig. 52, p. 318). During the eighth to tenth centuries the Frankish and Saxon kings established new bishoprics to spread Christianity. These were located in the Main basin, which, culturally, is virtually an extension of the Rhinelands; in the Loess Belt; as outposts against the Slavs on the Elbe-Saale frontier; and in the east Alpine lands. The location of the bishops' seats was closely adjusted to the distribution of the population at that time (i.e. the forest free lands), and to natural routeways; while their diocesan areas were similarly adjusted to those of the dukedoms. The Catholic faith spread eastwards to Poland via Cracow, and Bohemia via Taus, and Scandinavia via Lund, about A.D. 1000.

In the sixteenth century, long and bloody conflicts were fought in the name of religion, to which were added nationalist aspirations, once the torch of protest had been set alight by Luther. In Bohemia, the Hussite movement in the fourteenth century was an early protest against the Catholic Church, and this country would undoubtedly have become Protestant had it not been for the ruthless Counter-Reformation of the Habsburgs, which left it as a Catholic land. The Low Countries were a scene of strife at a later date. Here, national independence was achieved. The United Provinces north of the Rhine, together with northern Brabant immediately to the south, went over to Calvinism. The Flemings of Flanders did not join the Dutch, with whom they were far more closely tied linguistically and culturally than with the Walloons. "It was not geography, nor a difference in culture or in language, but an accident of religion, consolidated by persecution, that caused the separation of the Flemish in Belgium from the Netherlands."¹ The Dutch succeeded where the Czechs failed, and this was undoubtedly due to their skilful use of the natural defences of sea and marsh. Switzerland was already a free and independent country and contributed vastly to the new thought. But Switzerland, unlike the other two areas, from the beginning tolerated both faiths.

The complicated politico-cultural pattern of the German lands is

¹ Coon, *The Races of Europe*, p. 525.



FIG. 52—GERMANY: MEDIEVAL BISHOPRICS ABOUT 1000 A.D.
(from Aubin and Niessen) (scale, 1 : 6 m.)

1. Archbishoprics and bishoprics
2. Archbishop's sees
3. Bishops' sees

4. Abbeys
5. Cities

[Continued at foot of next page]

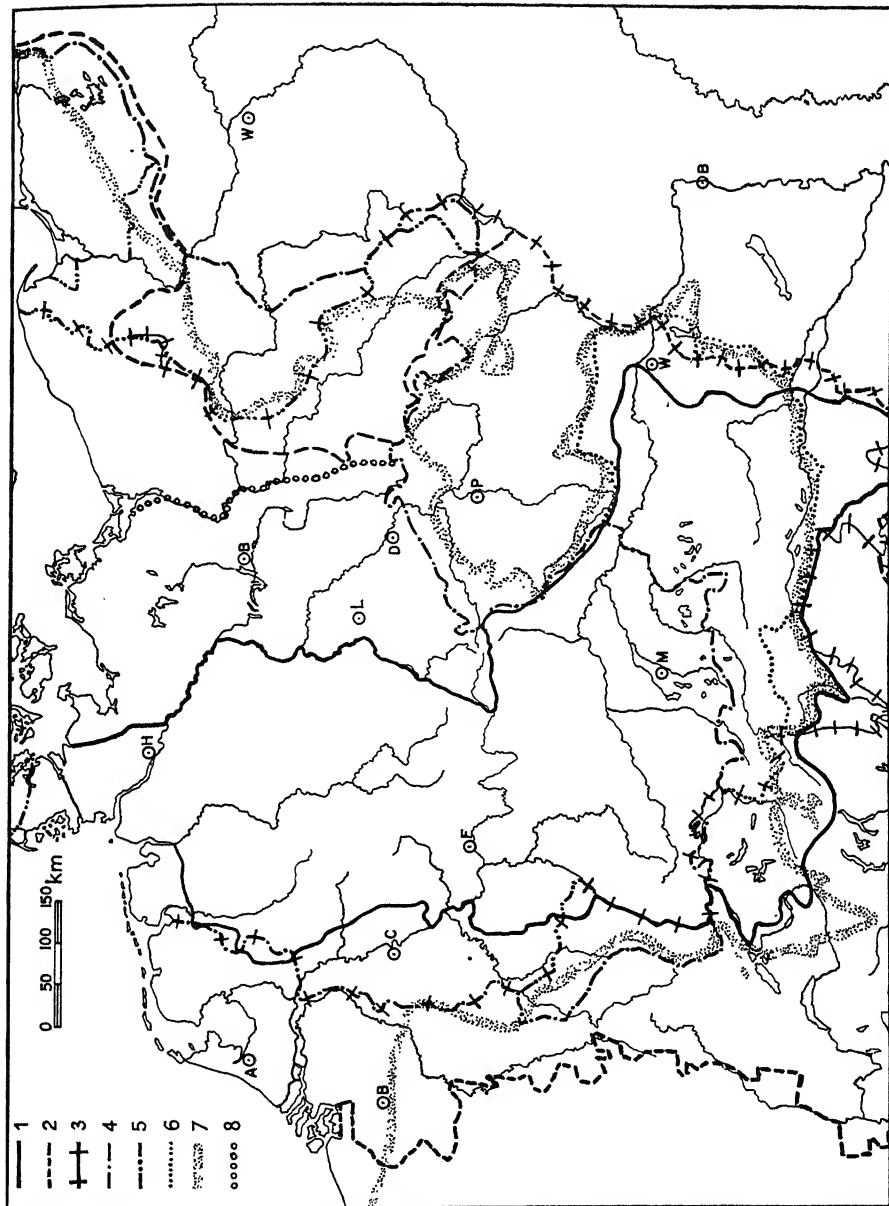
reflected in the distribution of religion. The peoples of the Northern Lowlands turned almost *en masse* to Protestantism. To it also adhered the whole of the lands of the middle Elbe basin and the land of the Hessian Corridor. From the confusion of states in the Main and Neckar lands there emerged a bewildering distribution of Catholicism and Protestantism. The states under secular rule, which stretched in a continuous belt in the upper Main and Neckar basins, from Württemberg to the Upper Palatinate, became Protestant. Thus, the zone of Protestantism extended southwards as a narrowing wedge with its apex in Switzerland, limited to the east by the Danube valley and Bohemia, and to the west by the Rhinelands. In Bavaria, Austria and Bohemia, Catholicism remained dominant under the Habsburgs. To the west the majority of the French peoples also remained true to the Catholic faith. In the Rhinelands the Catholic bishoprics maintained their hold, except in the Rhenish Palatinate. Of particular significance are two areas which break into the main area of Protestantism, and which are focused upon old-established and strong bishoprics like those of the Romanized lands. Westphalia (Münster, Osnabrück, Paderborn) remained Catholic and formed a large enclave between Lower Saxony to the east and Holland to the west. In the Main valley, the dioceses of Würzburg and Bamberg, like Bavaria, to which they were politically attached in 1815, also remained islands of Catholicism.

THE REICHSBODEN

The Reichsboden is shown on Fig. 53. The "historical Deutschland" appears first as the Holy Roman Empire (the first Reich), that persisted for a thousand years; then it continued in the nineteenth century as the German Confederation; later, in 1871, as the second Reich; then, in 1918, as the Republic of Germany; and in 1933 as the third Reich. This assembly of German peoples is the pivot around which European movements take place. Throughout the Middle Ages, the Holy Roman Empire, though lacking effective political unity after 1200, and divided into a number of parts different in their economies, cultures, and national aspirations, formed a group of states that were thrown together through geographical propinquity in both peace and war, and

Fig. 52. These bishoprics' divisions were established under the Merovingian and Carolingian Emperors. Whereas the archbishopric of Trier stretched down the Moselle valley it was only able to include a small portion beyond the Rhine valley for here, east of the Rhine, the work of St. Boniface had brought this area under the jurisdiction of the archbishop of Mainz. To the latter were added the bishoprics of Paderborn, Halberstadt, Hildesheim and Verden after the conquest and conversion of the Saxons. The sphere of influence of the bishop of Cologne was similarly extended eastwards to beyond the Rhine after the conversion of the Frisians and Saxons. The boundaries are based on exact data for the later middle ages, but these may be referred back to this earlier period.

united through the dominance of German speech and culture. At the end of the Middle Ages the Reich was bordered by France along the Meuse and the Argonne uplands, although in the next centuries France expanded eastwards to the Rhine and the Alps. To the east, the Reich bordered on Poland, which at the height of its power in the eighteenth century stretched from the Baltic to the Carpathians, though in 1815 it contracted to the Vistula core and the western territories of West Prussia and Posen fell to Prussia. To the southeast lay a great permanent politico-geographical unit, framed by the Carpathians and the Save river, namely, Hungary. The Turks reached to the doors of Vienna, but Hungary rose again in the seventeenth century, and the boundary from the Beskides Mountains to the head of the Adriatic is one of the old-established and meaningful human frontiers in Europe, just as was that of the nineteenth-century frontier against Congress Poland. To the north lay the group of Scandinavian states, closely allied in peace and war, with the centres of population and political gravity on the shores of the southern Baltic and the Kattegat and its key-point in the exits from the Baltic. The Hanseatic League, Denmark, and Sweden have each played the same role in turn of attempting to turn the Baltic into a closed sea. It came closest to this in the seventeenth century when Sweden, long holding Finland as a political and cultural appendage, added most of the Baltic provinces south of the Gulf of Finland in 1648, and annexed Bremen, Verden, and Stettin, and thus controlled the mouth of the chief German rivers. The struggle between Denmark and Sweden for the control of the Sound resulted in the victory of Denmark and then, after 1815, Norway, breaking away from Denmark, was under the same crown as Sweden until 1905 when it became independent. The Eider river at the neck of the Jutland peninsula is the historical frontier between Denmark and the German realm. South of the Alps, the German Emperors early interfered in Italian affairs, but there was never any long-term annexation of these lands to the German realm, with the exception of the southern Tyrol beyond the Brenner. The German Reich had a footing in Carniola at the northern end of the Adriatic where now lie Trieste and Fiume. Switzerland, the dukedom of Milan, and the Republic of Venice framed the Reich to the south. The kingdom of Burgundy early disintegrated. The Franche Comté, that commanded the routeways from the Belfort gap into France and had its ancient capital in Besançon, remained nominally a part of the Reich until 1678, when it finally passed to France. Savoy in the French Alps south of lake Geneva remained an independent political unit until 1860. This was the broad framework of the Reich at the end of the Middle Ages out of which the modern politico-geographic pattern of continental Europe has evolved.



1. Eastern frontier of the Reich in 843
2. Hohenstaufen Reich in 1200
3. Confederation in 1915
4. Second Reich in 1871
5. Weimar Republic in 1919
6. Third Reich in 1938
7. German-speaking area (1938)
8. Eastern boundary of Potsdam Germany

FIG. 53—CENTRAL EUROPE: THE BOUNDARIES OF THE REICH (scale, 1 : 12 m.)

The Reich, however, was a loose agglomeration of states and by 1648 two of these, the United Provinces and Switzerland, achieved complete independence. Moreover, the expansion of France to the Rhine was marked by the final annexation of both Alsace and Lorraine in the eighteenth century. To the south, however, the frontier fluctuated very little over a thousand years. It lay south of the Brenner to enclose the southern Tyrol and ran thence along the Carnic uplands to Trieste. To the east also the frontier has been remarkably constant. The first line of defence of the *limes danicus* on the Eider river to the north and the *limes saxonicus* along the lower Elbe, the Saale and Naab rivers, were the first frontier against the Slavs, erected in the tenth century. By the end of the Middle Ages this frontier was extended eastwards and remained stable between the Baltic and the Adriatic. The eastern frontier in the Northern Lowland remained fixed until eliminated in 1918, for it was not until the end of the eighteenth century that West Prussia and Posen were annexed by Prussia. From the Moravian Gate southwards to the Adriatic the frontier was clearly defined in 1200 and persisted until 1918. Detailed fluctuations of these frontiers must be studied from Fig. 53 and from the text that follows. We may now turn to the politico-geographical units that make up the German realm.

MEDIEVAL DUKEDOMS AND MARCHES

There are distinct culture traits associated with the peoples of German speech, although many features of their medieval civilization were shared with all the peoples of western Europe. Moreover, in the Middle Ages, the Holy Roman Empire embraced all the German-speaking peoples. But in this period and after we note two general processes which have militated against both the cultural and political unity of all these peoples. First, the Reich contracted within its original limits, so as to exclude peoples of German speech; second, the whole of the original Holy Roman Empire split up into a number of cultural and political provinces, several of which developed into individual nation-states. We shall now discuss the extent and characteristics of the chief of these political groupings.

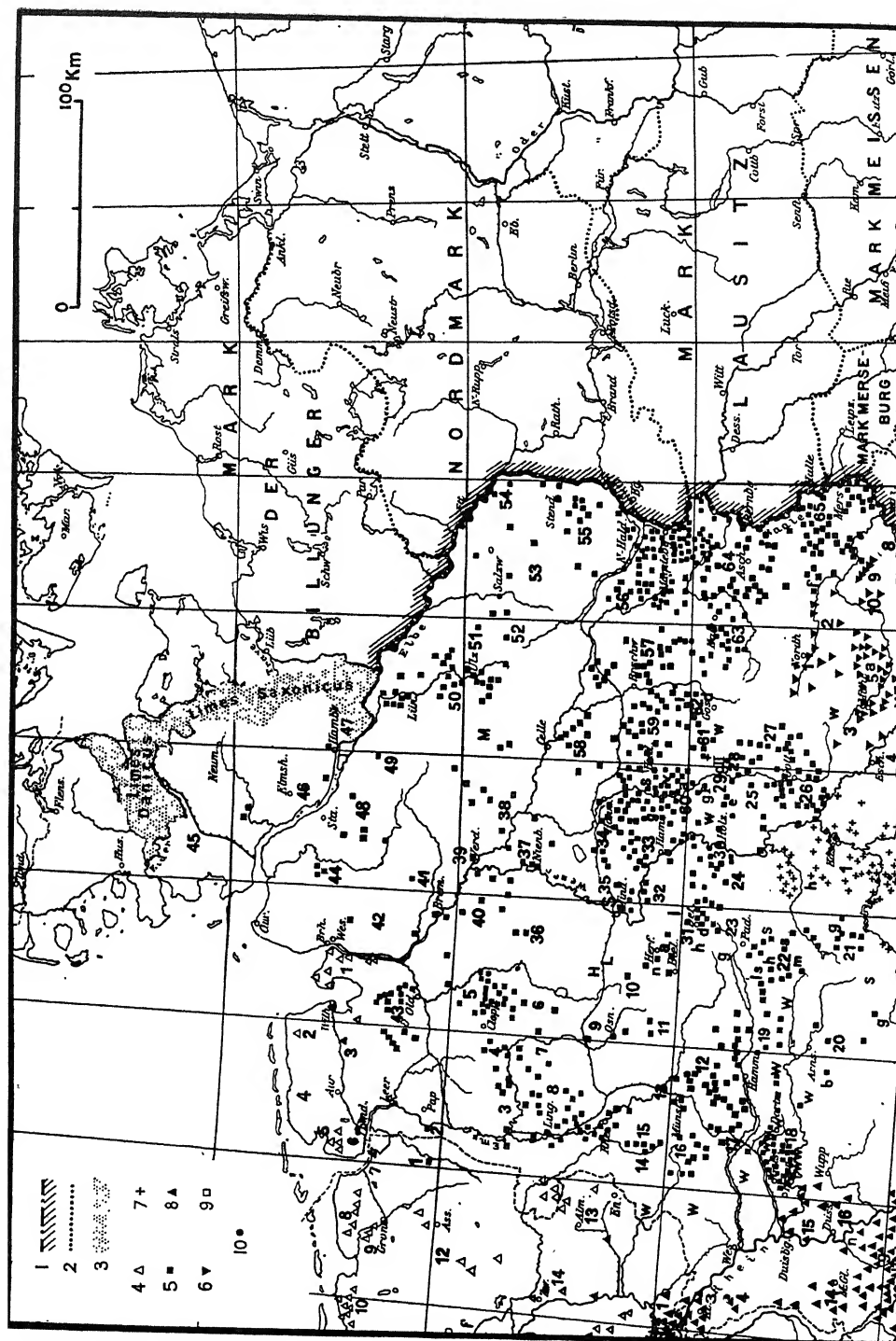
The Confederations of the German tribes settled in separate geographical areas which were divided in themselves into several detached, though interconnected seats of settlement, and each tribal confederation was separated from its neighbours by belts of forest and marsh. The conditions of this initial settlement are analogous to the settlement of the Anglo-Saxon tribes in England, the Weald, for example, serving the role as a barrier between the areas of tribal settlement on the chalk uplands to north and south of it. "Whether as barrier or bulwark, frontier march,

or area exempt from private ownership, the forest served as a framework for the embryonic societies which ushered in the political groupings of Europe."¹ Written of France and England, this statement is equally true of the west German lands.

The location of these settled areas is shown by the earliest historic records available. (Fig. 54.) The initial politico-geographical unit was the *Gau*, which word is the German form of the Latin *pagus*, and thus has the same origin as the French word *pays*. Among the Germans this was the territorial unit that had a political significance above the local groups of the village and the mark. It formed the unit of administration in the Carolingian political organization in the ninth to tenth centuries, many of which came to be known as *Grafschaften* (*comitates*), which were the equivalent of the French *comtés* or the English counties. Such territories, however, as the *Gau* and the *Grafschaft* were not always identical. Fig. 54, taken from the *Atlas des Deutschen Lebensraumes*, shows the location of places which are known to have been associated with a particular *Gau*, so that it does not claim to be an exact settlement map of that time. The majority of the names of these places are derived from records in which the place was involved in a transfer of territory to the Church, principally monasteries. But, nevertheless, the general areas shown do correspond with the most closely settled areas in the early Middle Ages (tenth and eleventh centuries). It may be further noted that these territories, which had settled cores in open lands and along main natural routeways, and separated from each other by wide forested peripheries, were often based upon the divisions that preceded the Germanic settlement after about A.D. 500. These divisions in the Rhinelands were the *civitates*, similar to those of the Roman lands of Gaul, and in inner Germany they were the *Volksgemeinschaften*, the tribal groupings whose centres of assembly were situated on the hill-top *oppida*. They were tribal districts similar to the tribal areas of Gaul with their similar centres that preceded the Roman settlement.

With the end of the Carolingian Empire, the German lands were divided into several great dukedoms, the extent of which was based upon the areas of the tribal confederations. These tribal duchies persisted until the early thirteenth century as the framework of the politico-geographical pattern of the Empire. Dukedoms (Fig. 14) and bishops' dioceses (Fig. 52) were coextensive, and in their full extent and their subdivisions they were closely related to the areas of the tribal territories. It may be added that the smaller German tribal units (the *Gaue*) and the Roman areas in the Rhinelands (*civitates*), which were focused on the scattered areas of settlement in the forest-free lands, were used as the skeleton of this early medieval framework of secular and ecclesiastical

¹ Vital de la Blache, *The Personality of France*, translated by Brentnall, 1922, p. 47.



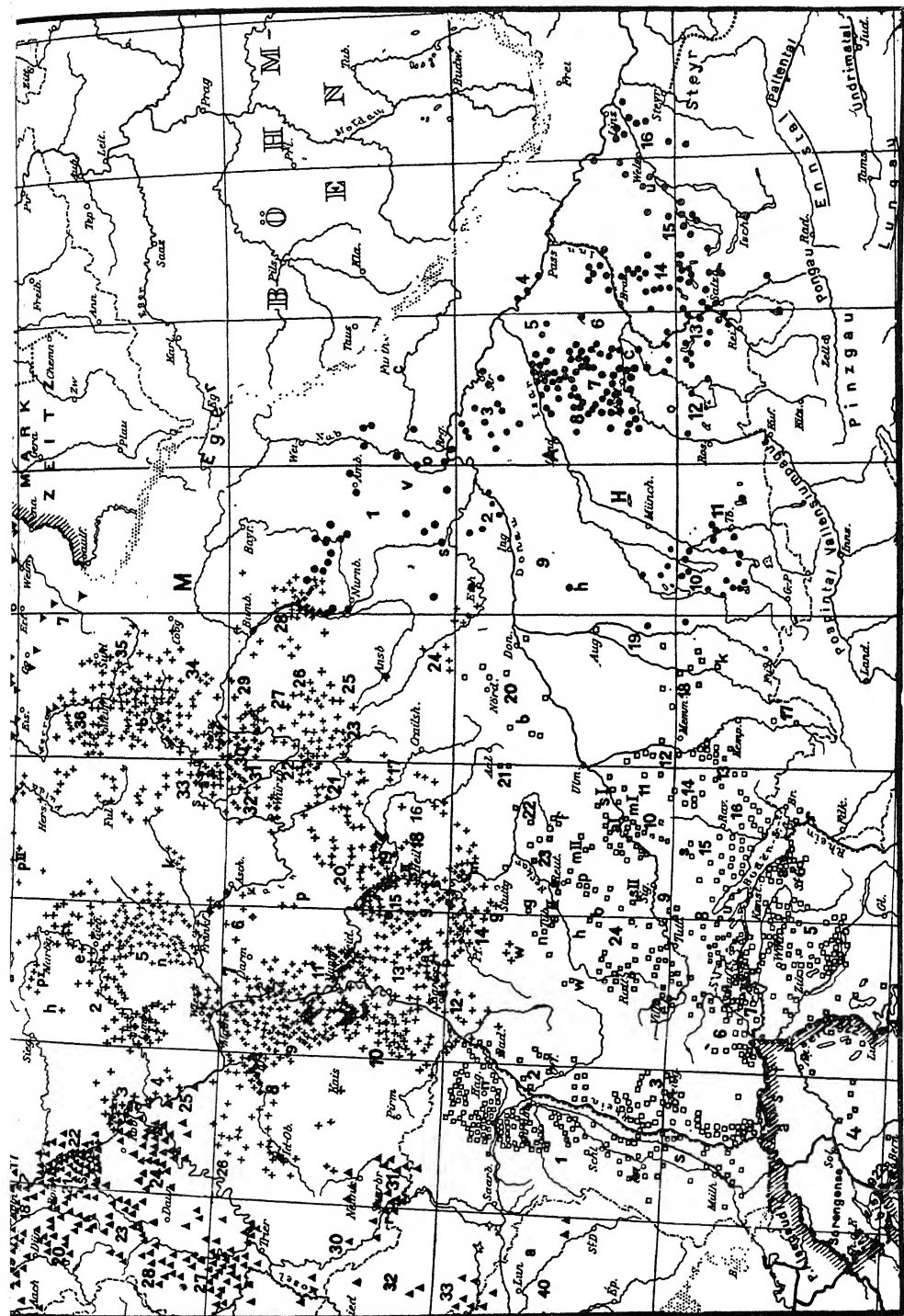


FIG. 54—GERMANY: GAU, MARCH AND DUKEDOM IN THE 10th CENTURY A.D. (from A. d. D.L.) (scale, 1 : 3.5 m.)

[For key see over

areas (Fig. 54, pp. 324, 325). In the west German lands the dukedom of Freisland embraced the northern coastlands. Saxony covered most of the Northern Lowland and the northern section of the Central Uplands. It fell into two sections, Westphalia and Eastphalia, that were divided by the transitional zone of the Osnabruck upland area. Franconia had its axis on the Main basin and also fell into two sections, East Franconia and West Franconia, that were separated by the woodlands of the Odenwald-Spessart-Rhön. Swabia lay in the southwest and had its nuclei of settlement in the Rhine valley, the Neckar basin and the Lake Constance area. Old Bavaria lay on the Bavarian Plateau between the river Lech and the Enns and had a northward extension in the Oberpfalz that was established in the tenth century as a march and shortly after added to Bavaria. To the west, in the German-Romance borderlands, lay the dukedoms of Upper and Lower Lorraine. These territories lay west of the Rhinelands and stretched west to the Scheldt and the Argonne to the limits of the Empire.

To the east of the west German lands lay a belt of marks or border provinces which fell into two groups. One was in the Northern Lowlands between the Elbe and the Saale and the Oder-Bober rivers; the other was in the east Alpine lands, stretching south to Istria. The Nordmark became the nucleus of Brandenburg. East of Bavaria the Nordgau was established as a mark but was absorbed by Bavaria in a few years, and the Ost Mark or Austria was eventually severed from its parent Bavaria.

Between these two groups of marks lay the kingdom of Bohemia and the margravate of Moravia. To the east of the marks lay the dukedoms of Pomerania and Silesia, which last early detached itself from the kingdom of Poland. East Prussia fell to the Teutonic Knights early in the thirteenth century. To the south of the Beskides, from Moravia to Istria, lay the unified kingdom of Hungary.

These tribal duchies, eastern marks, and Slav duchies and kingdoms, formed the initial framework of the political and ecclesiastical groupings of west-central Europe, within which, through constant associations within them, at a time when external relations were relatively unimportant for the common people, there developed a distinct culture which persists to this day.

LATE MEDIEVAL GROUPINGS: STATES, TOWN LEAGUES, AND KREISE

In the middle of the thirteenth century the west German dukedoms were split up into a confused pattern of small territories. While unified nation-states were forged from such territorial disintegration in France and in England, feudalism now ran amok in Germany. With the end of the Hohenstaufen line, a host of petty lords fought with each other for

scattered bits of land, each endeavouring to extend and organize his territories, to protect them from his neighbour, and to squeeze from them as much revenue as possible. It is significant that the greatest disintegration took place in the Imperial lands of the Hohenstaufen in Swabia and Franconia, and especially in the rich vinelands of the Rhine and Neckar, and along the great highways of traffic. The classic instance is the Rhine gorge, where all the neighbouring territorial lords—dukes and bishops—sought for a footing on the river to draw revenue from its traffic and from its rich wine-producing towns. The towns, too, became independent authorities—all those in the Hohenstaufen lands in the southwest became Imperial cities—and they joined in the general conflict, extending their territories so as to enjoy these advantages and to ensure trade and food from the land around them: Nuremberg may be quoted as an outstanding instance. All the bishops enjoyed temporal powers, and commanded areas of varying size. But it was the old-established and powerful bishoprics of the Rhine and the Main lands (Würzburg and Bamberg) which were able to maintain the territorial integrity of their large possessions. The lands in the Northern Lowlands and in Bavaria were also saved from disintegration by a continuous succession of rulers in one dynastic family (e.g. the Babenbergers in Bavaria). In the eastern lands, the marches and the old Slav dukedoms of Pomerania, Silesia, Mecklenburg and the provinces of the Teutonic Knights—West Prussia, East Prussia, Courland and Livonia—retained their territorial shape and their political unity under single rulers. There emerged in the aggregate some 360 independent sovereign states in the Reich, nearly all of which were located in the German lands west of the Elbe and the Bohemian Forest.

At this stage we may notice two developments in the Middle Ages and after which helped greatly to differentiate one area from another, namely, the unions of towns, and the organization of the *Kreise* in the Empire on a geographical basis to maintain peace and order.

In the absence of a strong central authority, groups of towns were obliged to co-operate in order to cater for their common political and economic interests. The chief cities emerged as capitals of their surrounding territories, and, headed by the bishop or town council, they tried to build up a surrounding territory over which they could exercise full sovereign rights, and from which they could draw the food supply and local trade of the town. We may cite the cases of Cologne and Nuremberg

Fig. 54.

- | | |
|--|---|
| 1. Boundary of German Reich | 3. Uncertain boundary of the German Reich |
| 2. Boundary of Marks | |
| Districts belonging to the same Dukedom are shown by symbol: | |
| 4. Friesland | 8. Lorraine |
| 5. Saxony | 9. Swabia |
| 6. Thuringia | 10. Bavaria |
| 7. Franconia | |

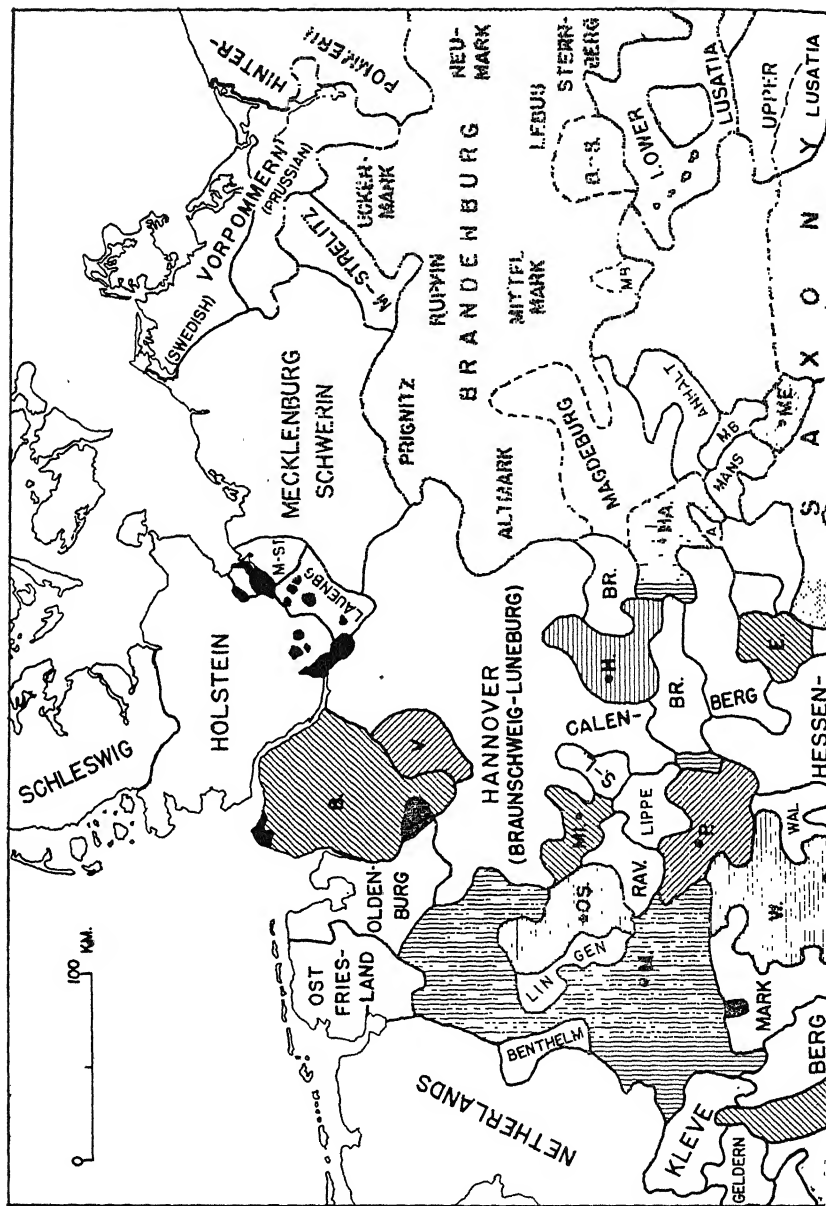
as examples. Moreover, the common economic needs and political interests of the merchants and craftsmen in the towns led to the combination of neighbouring towns for all kinds of purposes. Such groups were, in fact, not merely political groups of towns, for, since the town served primarily as the seat of commerce for its surrounding lands in both manufactured and food products, they reflect the unity and extent of distinct areas of economic activity which they served. They combined to stabilize weights and measures and coinage, to preserve the peace, to maintain the safety of the trade routes, to raise their bargaining power, and, in extreme cases, to make war. Many of these groupings were organized for *ad hoc* purposes, and their membership for these specific purposes varied from time to time. But there is an undoubted combination of groups in definite geographical areas which had kindred economic character. The largest of these unions was the Hanseatic League, which began as a union of the Baltic towns, headed by Lübeck, to defend themselves against piracy in the northern seas. It developed into a vast trading organization, including towns in Flanders, throughout the German lowlands into Scandinavia, the Baltic and central Russia. These cities were very far-flung but most of them were in the German Reich, and after 1376 they were organized into four groups, each in a distinct geographical area, whose towns had a similarity of activity and interests. These groups were the Baltic ports, with their focus in Lübeck; the lower Rhineland group, centred on Cologne; the lower Saxony group, centred on Brunswick; and the East Prussian group, centred on Danzig. In the north, the Wendish towns—Hamburg, Lübeck, Wismar, Rostock, Stralsund, Greifswald, and Stettin, the great Baltic ports for the Baltic trade—formed a firm and lasting combination. The towns of the Harz Foreland formed another group, including Brunswick, Hildesheim and Goslar. The Silesian towns were united by their common interests in the textile industry; and the weaving towns of Upper Lusatia formed the Six Town League to regulate their trade with Nuremberg. The Swabian League arose in the fourteenth century through the combination of the Imperial cities in the Swabian lands of the Hohenstaufen, and was headed by Ulm. Its original fourteen cities were joined by twenty others, including the seven cities around Lake Constance. These latter towns had their common interests in their textile industries, and the trans-Alpine commerce (Isny, Ravensburg, Ulm and Augsburg). A Rhine League of nearly a hundred towns was formed in the thirteenth century, but it did not last long, and was displaced by several small groups in close proximity. Here we find the unions of the middle Rhine towns, stretching from Mainz to Strasbourg; the League of the Ten Towns in Alsace; and the League of the Upper Rhine Towns, which included Basel, Colmar, Freiberg and Muhlhausen. The Prussian

towns formed a separate group under the unified control of the Teutonic Knights. The towns of Flanders and Switzerland formed two quite distinct groups, each of which, in large measure, was politically independent. The first group was centred on the two emporia of Bruges and Antwerp, and included many commercial and industrial towns. The second group of towns was politically associated through the *Eidgenossenschaft*, and their common interests were based on their dependence on the trans-Alpine trade and their textile industries. The towns of Flanders were closely allied with those of western Holland, and entered into commercial agreements with them in the fourteenth century. Even the towns of Austria and Styria had their separate organizations.

In the late Middle Ages the emperors made repeated efforts to re-establish some kind of general law and order in the multitude of independent sovereign states in the Reich. They endeavoured to widen the basis of the regional associations of towns, by the group action of sovereign states in compact geographical areas, for the maintenance of peace and order. These areas were called *Kreise*, and were concerned primarily with raising and financing of troops. Efforts of this kind date from the fourteenth and fifteenth centuries, but a permanent reorganization of a limited number of areas was not effected until the Treaty of Augsburg in 1555. There were in all ten *Kreise*, and their functions, slender though they were, persisted until the end of the Reich. These areas reveal the permanence of old frontiers and political units. The boundaries of the dukedoms in the west reappear in the *Kreise* and the old stable divisions in the east persist. The Netherlands (excluding the bishopric of Liège in the Meuse valley), the province of Burgundy, and Switzerland, all form distinct *Kreise*. In the east, groupings of two or more of the old provinces form the Austrian (or Habsburg) and Upper Saxon (Saxony, Brandenburg and Pomerania) *Kreise*. Bohemia-Moravia and Silesia were excluded from the scheme. The *Kreise* in the remainder of the German Reich were Franconia, Bavaria, Swabia, Upper Rhine (Alsace-Lorraine), Hesse, as a detached but compact partner area, Lower Rhine-Westphalia, and Lower Saxony. The *Kurrhein Kreise* contained several territories in the middle Rhine lands that included the bishoprics of Cologne, Trier, Mainz and Speyer, and the Palatinate.

POLITICO-GEOGRAPHICAL GROUPS IN 1790 AND 1815

The political map of 1790 was basically the same as five hundred years previously (Fig. 55). The main changes after 1600 were the growth of four states, Prussia, Saxony, Bavaria and Württemberg. The last three extended their boundaries slightly but the greatest changes were brought



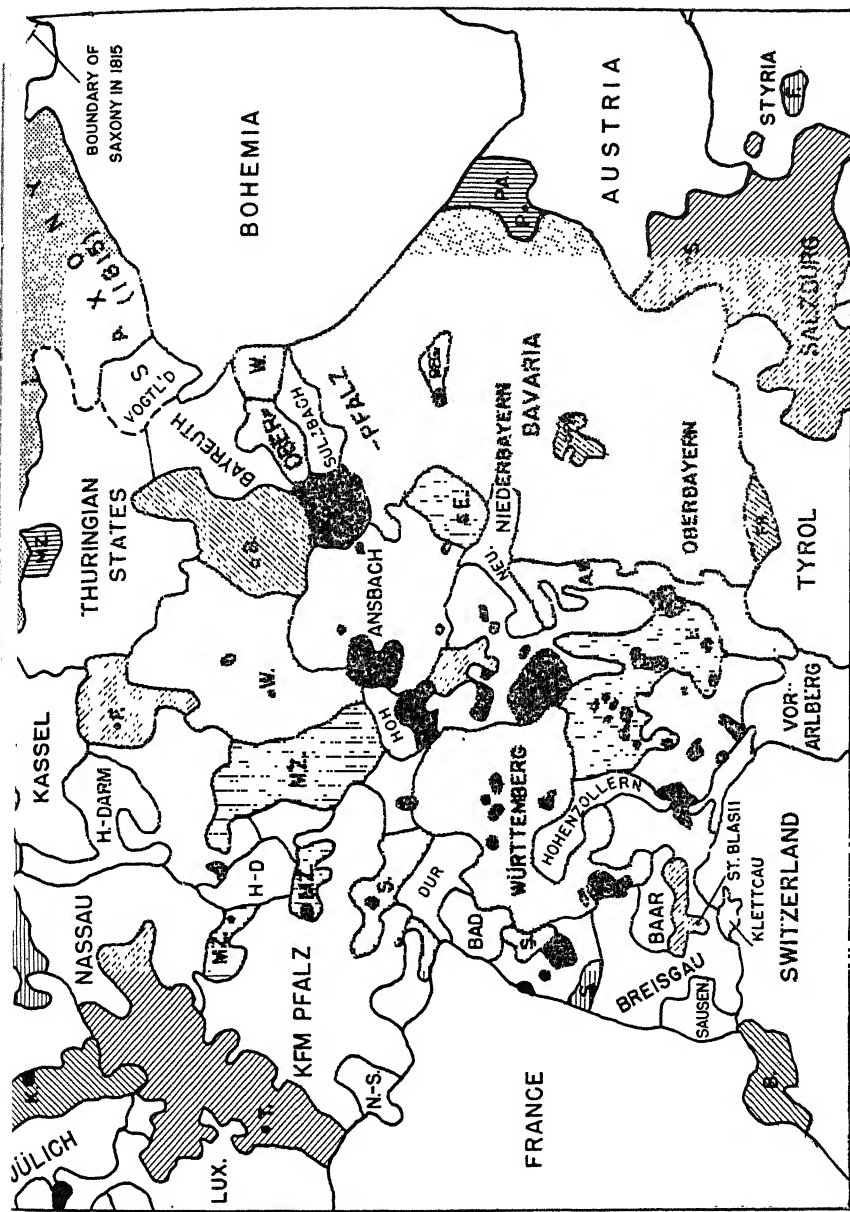


FIG. 55—GERMANY: POLITICO-CULTURAL DIVISIONS IN 1790 (by the author) (scale, 1 : 4 m.)
 This map generalizes the largest territories in 1790 and omits the complex patterns of small territories in Thuringia the southwest, the middle Rhinlands, and the Weser Uplands area. Stippled areas show Brandenburg, Saxony, Bavaria and Württemberg, each about 1600. Hatched areas show bishoprics in 1790. Black are Imperial Free Cities. Other areas are named but unshaded. (*Grafschaften* or counties, *Fürstentum* or Princedom, *Herzogtum* or dukedom, *Königreich* or kingdom). Key to Initials:

Rav. = Ravensburg
 Wa. = Waldeck
 M.St. = Mecklenburg-Strelitz
 B-S = Beeskow-Storkow
 Mz = belongs to Kfm. Mainz
 H-D = Landgrafschaft Hessen-Darmstadt
 N-S = Gft. Nassau-Saarbrücken
 Dur. = Durlach
 Bad. = Baden
 Mans. = Gft. Mansfeld
 Hoh. = Fsm. Hohenlohe
 Neu. = Hzn. Neuburg
 Note. Initial letters refer to bishoprics. Magdeburg (MdB) and Halberstadt were bishoprics until 1680.

about by the growth of Prussia in the Northern Lowlands. From its nucleus in the Altmark of Brandenburg, Prussia first expanded eastwards to control the two wings of territory in West (1772) and East (1618) Prussia to the north, and Silesia (1742) to the south. To the west it annexed, in the seventeenth century, various scattered territories between the Rhine and the Weser (Cleve, Mark, Ravensburg, Magdeburg, Halberstadt, Minden). Bavaria under the Wittelsbach dynasty stretched from the Alps to the Bohemian Forest, from the Lech to the Inn, adding the Rhineland Palatinate in 1777. Its nucleus lay south of the Danube, the area to the north being known originally as the Nordgau. Saxony developed in the Middle Ages in the upper part of the middle Elbe basin, between the Mulde and the Elster, from a very confused territorial pattern, which included as its core the mark of Meissen. Her chief annexation after 1600 was Lusatia. Württemberg had its nucleus in the middle Neckar basin. Apart from these lands, the old provinces in the southeast remained under the rule of the Habsburgs. They included the kingdom of Bohemia, the margravate of Moravia, the dukedoms of Austria, Styria, Carinthia and Carniola, the county of Tyrol, together with the isolated territories in northern Switzerland, and the upper Rhine plain, where the Habsburg line originated.

In the west, outside the territories we have noted, extreme disintegration was characteristic. The largest unified lands belonged to the most powerful bishoprics—Münster, Cologne, Trier and Mainz—in the Rhinelands: Würzburg and Bamberg in the Main lands; Augsburg and Salzburg in the Alpine area. The independent free cities, the so-called Imperial Cities, which became fully independent authorities with the end of the Hohenstaufen line, are located almost exclusively in the territories of that house in Swabia; in the north were the great emporia of Lübeck, Bremen and Hamburg. Lastly, a host of petty lords, chiefly in the former Imperial lands, divided the land between them.

In this general development Prussia expanded to include all the eastern lowland provinces, and began that expansion westwards which in the nineteenth century eventually unified all the Northern Lowlands. This brought out the strong difference in the political development and politico-geographical structure between the Northern Lowlands, southern Germany, and the Habsburg lands.

The Holy Roman Empire of the German Nation tottered and collapsed at the end of the eighteenth century before the onslaught of the armies of Napoleon. By the Treaty of Basel in 1795 Prussia granted to France the Rhine as a frontier and France took possession of the left bank in 1798. In 1803 the life of the Empire neared its ignominious end. Talleyrand in Paris caused nearly a hundred and fifty sovereign states to disappear from the map, including all the territories of the eccle-

siastical princes, and the free cities, with the exception of Hamburg, Bremen, Lübeck, Frankfurt, Augsburg and Nuremberg. These lands were distributed among the secular princes, an act that was recognized at the Congress of Vienna. The defeat of the combined Prussian and Austrian forces at Austerlitz in 1805 by the French forces was followed by separate treaties imposed by Napoleon on Austria and Prussia. In 1806 sixteen German princes in the west formed the Rhenish Confederation with Napoleon as Protector, and the lands of seventy other small lords were divided between them. In the same year the Emperor abdicated. Prussia collapsed before Napoleon. The kingdom of Westphalia was established under Napoleon's brother, and included the Prussian territories west of the Elbe together with Brunswick and Hesse.

The states of the Confederation were reorganized in constitution and geographical composition by rulers who were French in origin or sympathy and were put there by Napoleon. Thus, Bavaria was reorganized by Maximilian Count Monteglas, and similar reforms were introduced in Württemberg, Baden, Hesse, and Westphalia.

Prussia attempted great reforms in the period 1807 to 1811. Serfdom was abolished by the decrees of Stein, but these were distorted by the Junkers in the east so as to dispossess the peasant. Municipalities and rural government districts were reorganized and freedom of trade between the provinces was established. Stein's liberal reforms were premature for an aristocratic, autocratic Prussia, and Hardenberg adapted them with the purpose of creating an efficient Prussian state.

With the formation of the German Confederation (*Der Deutsche Bund*) in 1815 the politico-geographical pattern was much simplified (Fig. 56). The 360 independent sovereign states were reduced to 39 in 1803 by France, and this was recognized by the Congress in 1815. Many of the disintegrated territories had been amalgamated, especially in the southwest, where the states of Baden, Württemberg and Bavaria were created, although they correspond closely to the political groupings which preceded them. Numerous scattered territories remained in the Central Uplands and in the middle Elbe basin. Everywhere the temporal power of the bishops had been destroyed and their territories secularized and absorbed into new states. Outstanding is the expansion of Prussia in the Northern Lowland. It expanded westwards at the expense of Saxony to the middle Weser in Thuringia; and added the lower Rhineland, which were organized into the two new provinces of Rheinland and Westfalen, though the older divisions were retained as the basis of the new administrative framework. In the east, the old provinces were retained—Mecklenburg, Pomerania, Brandenburg, Silesia, East and West Prussia. The Altmark, together with the Magdeburg district, formed the new province of Saxony, bordering on the kingdom of that name to the

south of it. Between the eastern and western lands of Prussia a wedge was preserved in the kingdom of Hanover, which was attached to the English crown as a bar to the territorial consolidation of Prussia. Bavaria retained the Palatinate and added the territories of the bishoprics of Bamberg and Würzburg, in the Main lands. Austria lost its Rhineland possessions and became a compact land, including the central and eastern Alps, the Danube valley and Bohemia-Moravia. It should be noted that the federal Diet had a membership of 39 in 1817, reduced to 33 in 1866, and that the smaller states were grouped in *Kreise* so as to give an effective membership of 17.¹

THE HISTORICAL POLITICO-CULTURAL GROUPS

Historical maps of the German Reich before 1806 show by a patchwork of colour nearly 400 independent authorities in the Holy Roman Empire, while in the nineteenth century such maps show the extension of Prussia across the Northern Lowlands and the independent states to the south of it. There are, however, provinces, often consisting of many scattered and interlocking territories before 1815, and even in modern times, which in history have held together as permanent units of social life and organization from the early Middle Ages to the present day. It is to these provinces that we wish to draw attention. Thus, we are concerned not with the expansion of Prussia but with the historical provinces which it absorbed. We are not concerned with the fact that the south German states were entirely new creations in the *political* sense in 1815, but that, in the main (for there were considerable territorial readjustments), they were simply the successors of territorial units of social and economic organization which had existed for centuries. The peoples in these provinces were welded together by similarity of environment and location, by their distinct separation from neighbouring areas, both by natural barriers and by permanent political frontiers, and by their common experience in peace and war, and their common economic activities. Some were, and still are, independent states, others were only historical provinces; and all enjoy a varying measure of cultural individuality. It is for this reason that we shall refer to these areas as politico-cultural provinces. They are shown in Fig. 55. This should be compared with the politico-geographic pattern in 1815 (Fig. 56).

As a German writer has pointed out,² it is absurd to trace the ethnic and cultural character of these provinces, especially in the west German lands, to the original traits of the German tribes or *Stämme* and to identify their extent with the initial extent of the tribal confederations.

¹ A. J. P. Taylor, *The Course of German History*, 1945, p. 74.

² W. Vogel, *Deutsche Reichsgliederung und Reichsreform in Vergangenheit und Gegenwart*, 1932.

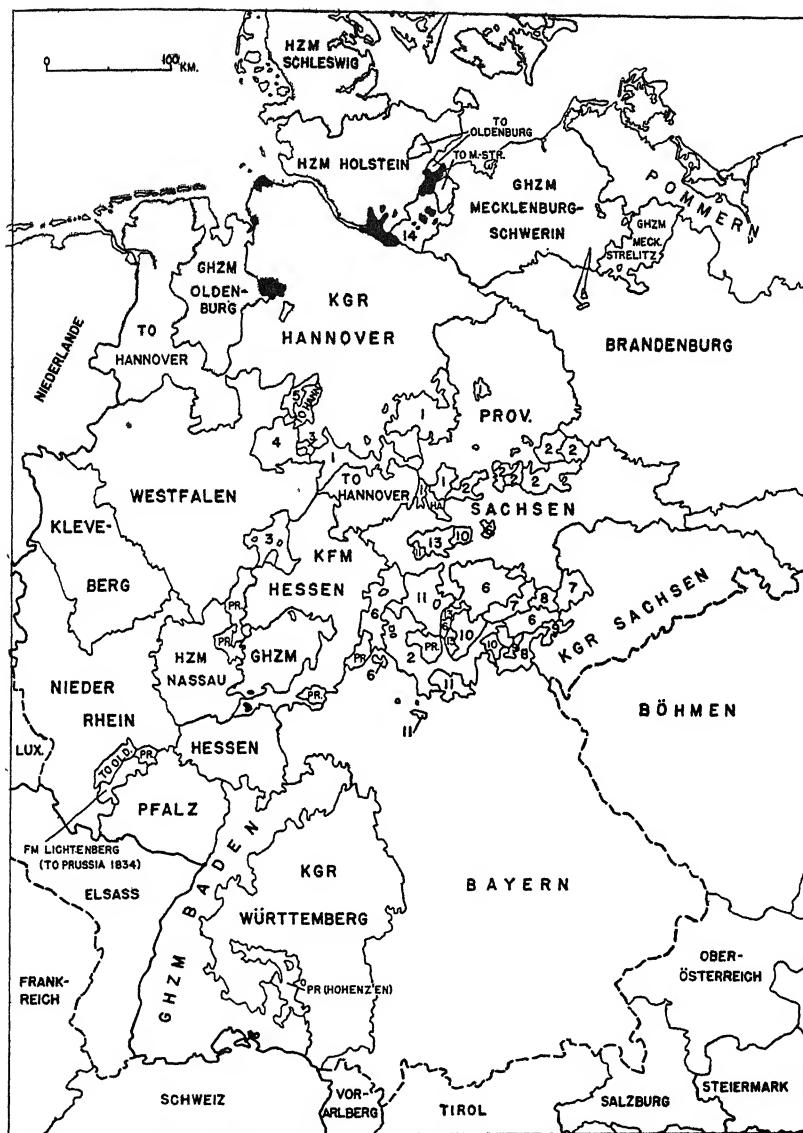


FIG. 56—GERMANY: POLITICAL DIVISIONS, 1815-71 (from *A. d. D.L.*)
(scale 1 : 6 m.)

- | | |
|---------------------------|-----------------------------------|
| 1. Brunswick (HZM) | 8. Reuss-younger-line (F) |
| 2. Anhalt (FM) | 9. Reuss-older-line (F) |
| 3. Waldeck (FM) | 10. Schwarzburg-Rudolstadt (F) |
| 4. Lippe-Detmold (F) | 11. Koburg-Gotha (HZM) |
| 5. Schaumburg-Lippe (F) | 12. Meiningen (HZM) (numbered 2) |
| 6. Weimar-Eisenach (GHZM) | 13. Schwarzburg-Sondershausen (F) |
| 7. Altenburg (HZM) | 14. Lauenburg (HZM) |

Independent cities shown in black:

Pr ⇒ Territories belonging to Prussia

KGR = Kingdom

GHZM = Great Duchy

HZM = Duchy

F = Principalities

The tribal duchies and the eastern border marches with the Slav provinces beyond them formed the foundation on which the political and cultural groupings have been built. These groupings of peoples, together with the imprint of their peculiar culture forms on the countryside and towns, have developed through the medium of a common group life through centuries of history. In the eastern lands there has been a remarkable persistencé of the outline of the provinces from the early Middle Ages. On the other hand, smaller politico-cultural provinces developed from the western tribal duchies, although the boundaries of dialects, culture forms and ancient tribal boundaries are often remarkably coincident and form, therefore, cultural divides of the first importance. Moreover, a comparison of the map of the politico-cultural provinces and the relief map (Fig. 13) reveals clearly that many of these provinces correspond with well-defined physical units, characterized by populous and early-settled nuclear areas, and frontier zones, which in the past, if not at present, were thinly peopled and formed definite barriers to human movements.

The tribal duchies of Upper and Lower Lorraine have experienced the greatest changes in history. The Burgundian state of the Netherlands established by Charles the Great split into two distinct provinces. The United Provinces, later known as Holland, is united by a common language, religion and history. The remnant of the Netherlands to the south, containing both Flemings and Walloons, was more closely affiliated to French culture, and formed the Spanish Netherlands, later the Austrian Netherlands, and, after a short period of union with Holland, finally became, in 1839, the new state of Belgium. To the south lay Luxembourg, which, through territorial losses in the early nineteenth century to Belgium, Prussia and France, was whittled down to its present size. Lorraine, with its nucleus in the Moselle valley, is a well-defined politico-cultural and physical unit between the Vosges and the Argonne uplands.

In the west German lands the framework of the politico-cultural provinces shows a close relation to the boundaries of the tribal duchies (Fig. 14). Bavaria has always retained the shape of its medieval dukedom, bounded by the Danube, Lech, Enns and the Alps. In 1815, through the annexation of new lands which historically were not allied to it, Bavaria included three provinces: the old Bavarian homeland in the Bavarian Plateau east of the Lech; the central area of the secular states of Nuremberg, Ansbach and Bayreuth, seats of great medieval industry, and mainly Protestant in faith; and the Catholic bishoprics of the Main valley which, when secularized, were added to Bavaria, although culturally they are more closely allied to Franconia. From the latter duchy of Franconia, that extended from Lorraine to Thuringia, there emerged the bishoprics of Würzburg and Bamberg just noticed, and, west of the

Odenwald and Spessart uplands, the nucleus of old Franconia in the north of the upper Rhine plain appeared in 1815 as the provinces of Hesse-Nassau, and, beyond the Rhine, the Rhenish Palatinate, that became, in fact, an outlier of Bavaria. Swabia in southwestern Germany fell into a bewildering pattern of small territories. The whole southwest was greatly influenced by Romance culture. Its territorial mixture is reflected in the great confusion in the distribution of Protestant and Catholic religions. Its lowlands have always been important seats of vine production. Each of its constituent provinces—Alsace, Baden, Württemberg and German Switzerland—has formed a distinct historical unit of human life and organization, clearly separated from its neighbours by natural barriers—the wooded uplands of the Franconian and Swabian Jura, the Black Forest and the Vosges.

In central Germany, in spite of its political heterogeneity, we note the association for centuries of its tattered parts to form the provinces of Hesse, whose nucleus was in the Hessian Corridor, and of Thuringia, in the lowland of that name. The latter, roughly coextensive with the old duchy of Thuringia, split into many territories and Ruritanian states, which were not united to form a compact state until 1919.

In the Northern Lowlands, the southern limit of the medieval dukedom of Saxony is still clearly traceable in the map of 1790 as the boundary of Münster and Hanover, and the same line appears in the re-organized territories of 1815. It is the southern limit of Low German dialects and of the German Nordic racial type, in addition to being a divide of the first importance in respect of historical development and cultural forms. In its politico-cultural fabric the early dukedom of Saxony falls into two parts, which during the course of history have carried various political names. The one is Westphalia and the other Lower Saxony (*Niedersachsen*). These two areas are distinct in their religion, the one Catholic, the other Protestant; in their historical development; in the character of their settlements, both rural and urban, their house types and their folklore. Between them lie Oldenburg, Schaumburg-Lippe, Lippe, the bishopric of Osnabrück, and the Grafschaft of Ravensburg. In history, as at the present, all of these have had their allegiances, political, cultural and economic, divided between Westphalia and Lower Saxony. They are, however, predominantly located in the Weser hill country in a belt south to Kassel.

From the complicated territorial pattern of the lower Rhinelands there emerged in 1824 a single Prussian province on the west side of the Rhine which, closely tied up with the territories which preceded it, extended to the western frontier of the Confederation and included the bishopric of Trier. (A province of Jülich-Kleve and Berg was first established in 1815, and in 1824 it was absorbed into the new province of Rheinland.)

Its eastern frontier runs parallel to the eastern bank of the Rhine against Westphalia, and this boundary closely fits with the western boundary of the old dukedom of Saxony and the bishopric of Münster which succeeded it.

East of the Elbe-Saale, the Bohemian Forest and the lower Inn, lie the Prussian and the Habsburg lands. Here there is a clear continuity of the politico-geographical structure from the early Middle Ages onwards. In the Prussian lands in the Northern Lowlands, Brandenburg, Mecklenburg, Pomerania, East Prussia and Silesia are old politico-cultural provinces which are also well-defined physical units. The middle Elbe basin above Magdeburg is an area of territorial complexity. From the first marches of Zeitz, Meissen and Lusatia there emerged the Thuringian March in the eleventh century. This became the nucleus of the lands of the Wettinian dynasty, which covered all the area in 1789. In 1815 there emerged here the kingdom of Saxony on the slopes of the Erzgebirge, and the new Prussian province of Saxony to the north of it with the independent state of Anhalt inside it, while Lower and Upper Lusatia, two old and stable units, passed to Brandenburg and Silesia respectively.

The Habsburg lands to the south and east include several large and persistent units. The Tyrol lies astride the central Alps, and has its two chief settled areas in the Inn valley to the north and the Etsch and Eisack valleys in the south. The Salzburg bishopric is continued in the present political pattern. Bohemia and Moravia have persisted for a thousand years. Three historical units are evident in the modern political divisions of the eastern Alps. There are: Austria, the Ostmark, with its capital in Vienna; Styria, centred on the Mur valley with its capital in Graz; and Carinthia, focused on the Drave valley, and with a strong Slav element in its people and culture. South of the Karawanken mountains is the Slovene province of Carniola, that impinges on the Istrian peninsula and lies adjacent to the province of Croatia.

In brief, there is a remarkable tenacity in the general alignment of the older frontier lines, many of which can be traced back to the boundaries of the early medieval duchies and marches. These politico-cultural provinces enclose the really effective human entities which developed in the formative phase of both the politics and the culture of the German lands, and in spite of often kaleidoscopic changes in the political fabric, they are always traceable, overriding the anomalies of political structure, which are often the result of fortuitous events. The peoples of these provinces, while sharing, in varying measure, in the common German culture heritage, have their own cultural and national character, which is based on centuries of independent historical development. The sovereign independence of a number of these peoples was modified by the domi-

nance of Prussia and by the ruthlessness of the Nazis, both within the political boundaries of Germany and in the states which border it.

THE REICH AND ITS POLITICAL DIVISIONS

The German Confederation grew out of the Confederation of the Rhine that was organized by Napoleon in the west German lands. It was assigned the boundaries of the old Reich with the exclusion of East Prussia and of the territories acquired by the partitions of Poland, namely, West Prussia and Posen. It included Bohemia-Moravia and Austria, so that the eastern boundary ran from the Beskide Mountains to the head of the Adriatic Sea.

The customs union of the German states was the next important step to the unification under the guidance of Prussia. The Prussian provinces were divided from each other by tariff barriers and other impediments to human intercourse and in 1818 a uniform tariff system was adopted. The smaller states were forced one by one to enter the system during the next ten years. The lesser states objected to such selfish coercion and established customs unions among themselves so as to make a united Germany unnecessary. In 1828 tariff unions were made between Hesse-Darmstadt and Prussia, and between Bavaria and Württemberg. In 1834 the various groups formed one single union, the Zollverein, that embraced all the states except Austria, Hanover and Hamburg. This development, it has been stated, "was not a step towards the unification of Germany, but a device for making the unification (under Prussian tutelage) less necessary".¹

After the war between Prussia and Austria in 1867 the latter withdrew from German affairs and the German Confederation was dissolved. The states north of the Main with the exception of Saxony were annexed by Prussia to form the North German Federation. The Reich of 1870 emerged through the alliance of the south German states with the North German Federation, skilfully managed by Bismarck, after a short and successful war against France. At this time the German alliance had 40 million people, as compared with France's 37 millions. The two opponents in effect were numerically equal. The difference lay in their war potential, in their preparedness for war.

The second German Empire, as established in 1871, was a union of twenty-six states under the leadership of an emperor. There were twenty-two monarchies: four kingdoms (Prussia, Bavaria, Saxony and Württemberg); six grand duchies (Baden, Hesse-Darmstadt, Oldenburg, Saxe-Weimar-Eisenach, Mecklenburg-Schwerin, Mecklenburg-Strelitz); five duchies (Anhalt, Saxe-Altenburg, Saxe-Meiningen, Saxe-Coburg-

¹ A. J. P. Taylor, *The Course of German History*, 1945, p. 62.

Gotha, Brunswick); seven principalities (Waldeck, two Schwarzburgs, two Lippes, two Reuss's). Besides these, there were three city republics—Hamburg, Bremen and Lübeck, the old Hansa cities, and one "Reichsland" or imperial territory, namely, Alsace-Lorraine, that was acquired from France in 1871 (Fig. 56).

Various changes took place after this date and in 1939 Germany contained the following states: Anhalt, Baden, Bavaria, Bremen (free city), Brunswick, Hamburg (free city), Hesse, Lippe, Lübeck (free city), Mecklenburg (formed in 1934 by the union of the two Mecklenburgs), Oldenburg, Prussia, Saarpfalz or Saarland (returned to Germany by plebiscite on March 1, 1935), Saxony, Schaumburg-Lippe, Thuringia (formed in 1919 by the union of the seven states of Saxe-Weimar, Eisenach, Saxe-Meiningen, Gotha, Saxe-Altenburg, Schwarzburg-Rudolstadt, Schwarzburg-Sonderhausen, and the two republics of Reuss) and Württemberg.

The political framework of 1939, on which the post-war pattern has been built, is shown on Fig. 57 (p. 368). Prussia, covering two-thirds of the area of the Reich, embraces most of the Northern Lowland, though it includes west of the Rhine Massif and the Hesse Corridor. Oldenburg, Mecklenburg, and the free cities of Hamburg, Bremen and Lübeck have sea-frontages on the northern coasts. In the centre there occurs the greatest complexity, for here are Anhalt, Brunswick (split up into twenty-eight parts), Lippe and Thuringia (formed from seven separate states), and Waldeck (absorbed by Prussia in 1934), together with various outliers of Prussian territory in Thuringia. The dukedom of Hesse is shaped like an hour-glass, with the old free city of Frankfurt in the waist. This waist included the Prussian province of Hesse, but formerly fell into two almost completely separate parts, the dukedoms of Nassau and Hesse, which had their common frontier on the west side of Frankfurt. The two areas were absorbed by Prussia and organized into one province in 1866. South of this heterogeneous group of central Germany are the compact states of Bavaria, Saxony, Baden, Württemberg. The Pfalz, a large compact outlier of Bavaria, forms a distinct politico-cultural entity, as the 1790 map reveals. The southern section of Hesse lies well to the south of the Main beyond Mainz and Frankfurt. An exceptional feature here is the lone Prussian outlier of Hohenzollern, homeland of the Imperial line, in the midst of Württemberg.

The emergence of these states as politico-geographical units has been examined, but we must now turn to the administrative divisions within each state. These were introduced in the lands of the Confederation on the pattern of the French system and were copied in Prussia under the leadership of Stein and Hardenberg.

Many important changes were made at the end of the eighteenth cen-

tury and in the early nineteenth century in the administrative units of western Europe. These changes were made in the heyday of road transport, just before the development of modern factory industry and the advent of the railway. The most important change was the creation of the Departments in France in place of the historical provinces. Each department was so defined as to have a central city chosen as its administrative centre accessible to all parts of the department in a day's journey. The historical province was abolished from the administrative system, although the department often shows a close relation to the earlier province, usually by a simple division of one province to form two or three departments. Each department was later divided into *Cantons* and *Arrondissements* defined on the same principle of the accessibility of a central town.

In Germany, similar changes took place, partly under the Prussian kings, partly through the reforms of the Napoleonic regime in the western states. We find, in pre-war Prussia, a fivefold hierarchy of administrative units, which came into being at the beginning of the nineteenth century. The *Provinz* was normally the direct successor of the old historical unit. The *Regierungsbezirk* and the *Kreis* (*Land* and *Stadt*) were new districts. The *Amt* was the successor of the group of several parishes or *Gemeinde* established in the later Middle Ages with its centre in a castle town. The main features of this system are repeated in the other states, although the names of the districts vary. The states of the Reich, referred to as *Länder*, are equivalent to the provinces of Prussia in this hierarchy. It may be noted, however, that many of these states are very small, though they enjoyed for centuries the full powers and status of independent sovereign states. In consequence, the small capital city is very distinctive among the towns of Germany.

It is of interest to note the comparative size of these administrative units. In Prussia the *Landkreis* and its equivalent in Saxony are remarkably equal in area. Each is compact in shape with a central town and has an average diameter of 20–30 km. This is comparable with the French canton. The English rural district, based on the earlier Poor Law Union, has an average diameter of about 15 km., that is, it is of the same order. The *Kreis* in Bavaria is the equivalent of the Prussian *Regierungsbezirk* and is roughly equal to a French department, with a radius of about 60–80 km. from its capital. Each *Kreis* has about 15–20 divisions each about 20 km. in diameter. The Bavarian *Kreis* and the French department and the German *Regierungsbezirk* are roughly equal in area to a medium-sized English midland county, such as Leicester or Warwick, which have a diameter of about 50–60 km.

There were twenty-five *Regierungsbezirke* in Prussia, each with an average population of 400,000. These followed closely the *Kammer-*

bezirke that were established by Frederick the Great for purposes of internal government. These divisions, in turn, closely followed the provinces or the historical divisions within them, such as Kurmark and Neumark in Brandenburg, and the provinces of Kleve and Mark and Ostfriesland and Halberstadt. The Bavarian *Kreise*, eight in number, were formerly named after the rivers that drained them, as was usually the case in the renaming of the departments of France, from whence the idea was drawn. But in 1837 they were given their present names, that were a revival of the older tribal district names. Oberbayern has an area of 6,400 square miles, but the remaining seven (including the Palatinate) have areas of 4.1, 2.1, 3.7, 2.9, 3.2 and 3.8 thousand square miles.

All this territorial consolidation of the states and the rearrangement of the local government units within them was accomplished before the first railway was built. Since then social and economic changes make necessary a more rational rearrangement of the major political divisions, and often of the smaller divisions of which they are composed. Such rearrangements were effected in some degree by the Nazis and their predecessors, and these have been continued under the auspices of the occupying military Powers by the reorganization of new states.

CHAPTER 14

REGIONALISM IN MODERN GERMANY

REGIONALISM OF POLITICAL ATTITUDES

FOR A thousand years, there was a German Reich in the heart of Europe. Though formed as the successor of the Roman Empire it was never Roman, and though enjoying the sub-title of the German Nation, it was never a nation state. Nation and state among the German peoples are developments of the nineteenth century.

Germany awakened late to a consciousness of national unity, of a "communauté spirituelle", as Ancel has put it. This consciousness was awakened in France in the fifteenth century and is symbolized by Jean d'Arc. It arose in the German lands as a reaction to outside influences, and these were predominantly French, towards the end of the eighteenth century. The movement was influenced by the wars of Napoleon and the French formation of the Rhenish Confederation in 1806 in the Rhinelands. This brief period of occupation brought sweeping reforms, although the foreign domination resulted in a rising tide of resentment and the emergence of a strong national sentiment.

In the eighteenth century the élite of Germany spoke, dressed, and ate *à la française*. The reaction against these French influences arose towards the end of the century after the campaigns of Frederick II, and found expression in the romantic nationalism of the *Sturm und Drang* movement. The leaders of this movement reverted to the origins of the German folk and found therein its national heroes. The movement also found expression in literature and music. The development of nationalism was simultaneously associated with the territorial expansion of Prussia and the consolidation of the German lands under its leadership with its capital in Berlin. With a footing on the Rhine in 1815, Prussia then proceeded to the *Anschluss* of the Rhinelands, in which French cultural penetration had always been strong and deep. This was effected through the customs union or Zollverein that was formed upon the withdrawal of French control and was completed during the 'thirties. Economic development began within this new unified political framework. It was slow but steady during the period of fifty years, down to 1870. A population of 25 millions in 1815 reached 40 millions in 1870. A protective tariff was adopted for the first time in 1865 and this served to consolidate the domestic market, excluded English manufactured goods,

and left a free field for domestic industry. A standardized currency, the *mark*, was established in 1867. The railway rapidly covered the land, a length of tracks of 470 km. in 1840 increasing to 18,000 km. in 1870. Coal production in Prussia increased from 1½ million tons in 1825 to 19 million tons in 1865, and pig iron from 134,000 tons in 1834 to nearly a million tons in 1864. The exports of woollen textile goods quintupled from 1834 to 1864 and the imports of cotton increased threefold. This development advances a stage further with the Bismarckian wars of the 'sixties with Austria, Denmark and France, so that from the *Staatenbund* there emerged the *Norddeutscher Bund* in 1867 and, finally, the federal state of the *Deutsches Reich* in 1871.

There followed the phenomenal growth of the next forty years, an astonishing and ominous, but inevitable, social and economic transformation. It was an age of coal and iron. Coal production jumped from 26 million tons in 1870 to 109 in 1900 and then to 153 in 1910. Production of coal increased tenfold in the Ruhr (11 to 114 million tons) and five-fold in Upper Silesia (6 to 34 million tons). It was the era of great capitalists, the *Gründerzeit*, the age of the Industrial Magnates—Krupps, Thyssen, Stinnes and Kirdorf—that witnessed the development of the *Kartel* through the vertical and horizontal integration of industry in the Ruhr and its dependent iron-producing area in Lorraine.

Social reforms were also rapidly effected—progress in hygiene, social insurance, workers' unions and the like. The grouping of miners and iron and steel workers into socialist syndicates began in Saxony by Liebknecht, a disciple of Marx, and were based in part on earlier unions that emerged in the sixteenth to eighteenth centuries. The Roman Catholics of the Rhinelands took an active interest in social welfare and here developed the Christian socialist movement and the Catholic Centre political party. In the 'seventies the Social Democratic movement, though it had its origins in Saxony, took firm root in the Ruhr in the 'seventies. From both movements there emerged two big unions among the Ruhr miners, that of the Social Democrats being by far the more powerful. This was treated harshly by Bismarck and its demands were in large measure countered by his social insurance legislation in the 'eighties.

The *Kulturkampf* of Bismarck (1873–9) was a struggle between the individual and the state and the problem lay in the treatment of the Roman Catholic Church and the organized groups of the industrial proletariat. It was, in effect, a struggle with the peoples of the Rhinelands in the effort thoroughly to incorporate them in the body politic of the new Reich. This was a matter of vital importance since the natural resources and new industries of the Reich were overwhelmingly concentrated in the Rhinelands. Throughout the nineteenth century there was discrimination against the Roman Catholics, who found it difficult to hold

public posts in the western provinces where they formed an overwhelming majority. The *Kulturkampf* also took the form of discrimination against the Slavic (Polish) peoples in the east and vigorous efforts were made to Prussianize these folk in school, church and market place by the suppression of their native tongues. Indeed, this was an era that was in large measure dictated by the Industrial Magnates of the west. Here, too, masses of population accumulated in the great industrial areas, so that the Rhinelands increased greatly in population and played an ever-increasing role in the policies of the Reich.

The development of large-scale industry and the influence of the *Magnaten*, however, was counterbalanced in the policies of the Reich by the development of agriculture in general and particularly by the political influence of the *Junkers* in the agricultural east. The conflict of Magnate and Junker is a keynote to much of the political development of Germany between 1870 and 1914, within the general framework of a beneficent national socialism, that aimed at the improvement of conditions of both industrial and agricultural workers, by steps that were progressive, but very slow.

In the east, beyond the Elbe, are the lands of Prussia, the lands of the great estates, controlled by the Junkers with a landless peasantry, a rural proletariat, as their workers. The reforms of Stein and Hardenberg, it is true, abolished serfdom, on the lines that had been finally effected by the French in the Rhinelands during the Napoleonic occupation, but the peasant found his status changed merely from that of a servile labourer to that of a landless labourer. Economic development and cultural progress were tardy in the Prussian lands. The bulk of the peasantry were still in large part Slavic in the eighteenth century, illiterate and with no experience of self-government. Especially was this true in the land of Silesia, which, when acquired by Frederick the Great in the late eighteenth century, was an indefinite frontier zone between German and Polish speech and culture. As the Prussian kings extended their territories in the east they established universities for the diffusion of Germanic culture. The provinces that were early absorbed into the German realm early acquired universities. Rostock and Greifswald date from the early fifteenth century, and Jena from the sixteenth century. Kiel dates from 1665 and Breslau from 1702. Thus, the first State Universities of Frankfurt-on-Oder and Königsberg were founded in the sixteenth century, and the University of Halle in 1694. The University of Berlin was not established until 1810, where Fichte spread the gospel of the German Nation in his *Reden an die Deutsche Nation*.

The social reforms introduced by the French in the west, where indeed the peasantry had long enjoyed freedom from feudal servility, necessitated such reforms in the eastern provinces of Prussia. These steps were

taken slowly and not very effectively at several dates during the next hundred years.

Stein and Hardenberg (1807-11) abolished feudal status and feudal dues. But during the next years the *Gutsherren* developed large-scale commercialized farming, and the peasant became a landless labourer, like the peasants throughout much of east-central Europe at that time. This is a movement that began in the seventeenth and eighteenth centuries in Schleswig-Holstein, where it was particularly associated with the consolidation of peasant holdings and the hedging of fields in order to fit the needs of a long system of rotation with an increasing specialization on livestock (*Koppelwirtschaft*). Here, however, there emerged independent consolidated peasant holdings with dispersed farmsteads, as well as larger estates. Further east, the great estate remained the rule. The sale of crops from the large estates was reflected in the growth of flour mills (rye), sugar refineries (after the introduction of sugar beet), breweries and distilleries (from potatoes). These activities could not absorb the population, that grew in virtue of high birth rates, and the urban centres of Berlin and the Elbe lands absorbed them in large numbers. The peasant was a landless labourer on the vast estates of the Junker, and the Junker represented the agricultural interests in the Reichstag in opposition in most issues to the Industrial Magnates of the west. A further attempt to better these conditions was taken by Bismarck by various laws in the 'nineties that were designed to settle Germans on the land on their own adequate holdings. This was effected especially in the Polish lands on the eastern frontier, and was designed as one of the means of Prussianizing the Polish people. It did little, however, to relieve the thirst for land of the German farm labourers. The great landowner remained predominant and only a very small proportion of land was held by small or medium-sized farm holdings, that could be worked effectively by a peasant and his family with some outside labour. The Nazis sought to increase the number of family holdings. They sought to establish a *Bauernadel* by the introduction of hereditary rights for holdings of an adequate size. About 5½ million acres were disposed of in this way into family farm units. But the large estate still remained dominant and the majority of the country folk possessed no land. Such a revolution in land ownership, it should be noted, took place in some of the succession states in east-central Europe in the inter-war period.

It will be apparent that in this modern development of the Reich, and more particularly of Prussia, there were two main class interests, the Junker and the Magnate, the one representing the agricultural interests of the east, the other the industrial interests of the west. Here, too, was a social contrast between a landless peasantry in the east and a country of small landowners and a *Klein Bürgertum* in the west and, again, between

Protestants in the east as against Catholics in the west and south. But across this general pattern there emerged also the concentration of population and working-class interests in the great cities in the industrial belt from Aachen to Upper Silesia. Saxony and the Ruhr were the two chief seats of social and political party agitation among the workers in the 1870-1914 period. Social Democracy had its origins in Saxony and the Catholic Centre Party in the west with its ideas of Christian Socialism. Both of these parties attended to the interests of the workers and the small professional man, the proletariat and the *Klein Bürgertum*.

The Conservatives represented the Junkers' agricultural interests and the Protestant Church. The Liberals represented the Magnates and large industrial and commercial interests. The Clericals (Centre) represented the Catholic Church and advocated, among other things, a beneficent State Socialism (through the Christian Socialists). The Social Democrats represented the interest of the workers. They had one member in the Reichstag in 1871 out of nearly 400. In 1912 they numbered 110 and were the strongest single party, closely followed by the Centre Clericals (93).

These were the parties which, in coalition, adopted the republican constitution at Weimar in July 1919. Before 1922, the Weser river and its continuation southwards through the centre of Bavaria divided democratic voting majorities (i.e. Social Democrat, Democrat, and Catholic Centre parties) in the west from non-democratic majorities (including the Right and Left parties) in the east. Communists obtained more than 20 per cent of the votes in the last free elections in November 1932 in Berlin, central Germany, the Ruhr and Hamburg.

Germany has had a double front in the cultural as well as in the military sense. The first front lies to the west. The Rhinelands have long been deeply penetrated by the ideas, ways of thought, and manners of French civilization, that Prussia sought to exterminate, and with much success, in the nineteenth century through a cultural *Anschluss*. Cultural penetration from France in the seventeenth and eighteenth centuries was followed by political annexation by Napoleon and the introduction of political, social and economic reforms throughout the Rhinelands during the Napoleonic wars. After the ignominious defeat of France in 1871, German influence became paramount. Bismarck and his successors compromised with the social and economic interests of west and south by tolerance of the Roman Catholic Church and by an elaborate system of state socialism, that protected the industrial and farm workers, the craftsman, and the shopkeeper. Outstanding was the system of social insurance, inaugurated by Bismarck, and elaborated by his successors.

French military sway was resumed after World War I through the demilitarization of the Rhinelands and military occupation for fifteen

years. In 1923 French troops occupied the Ruhr, on the claim that the Republic had failed to make its guaranteed reparation payments. This was met by "passive resistance" and was economically disastrous. A resumption of a policy that would capitalize on the historic role of the Rhineland as a transitional zone and a military buffer, and as the heart of Germany's economic and military power, lies behind French policy today.

The second frontier zone of Germany is to the east. Here the peasantry is still largely landless. Here in Saxony there is a great new industrial complex alongside the old industrial area in Saxony. Reforms of land ownership were sorely needed in the eastern provinces of Germany. These had begun to be tackled by the Nazis. They have been precipitated by the Russians. Today the Russian control extends west to the Elbe, and this whole zone is passing through a phase of social, economic and political change comparable, in effect, with the changes brought to the Rhinelands during the Napoleonic occupation.

We have emphasized the regional diversity of the German peoples and outlined the extent and characteristics of the politico-cultural divisions of the historic Germany. This diversity has acquired a new significance since 1870 through the emergence of a new social and economic structure and through the persistence of the old semi-independent political units as a loose federation of states that has been dominated by Prussia.

This regional diversity is reflected in movements towards regionalism and federalism. These movements are based on the background of the historical development of the sectors of Germany and upon the modern economic and social development. There is also a great difference in the attitudes and aspirations of the component political units. The chief of these is Prussia. But also of great importance are Bavaria and Saxony. The Rhinelands as a whole have also played a vital role in the development of modern Germany. Finally, the complexity of the federal structure of the Reich and the dominance of Prussia as against the smaller partners, as well as the increasing complexity of the internal organization of the Reich, have given rise to a great deal of administrative devolution within the framework of new regional units. Much thought was given after 1918 to the question of the suppression of the hegemony of Prussia and the reorganization of the component states in a new federal Germany. To these questions of political geography we may now briefly turn.

PRUSSIA (Fig. 55)

The State of Prussia had its nucleus in Brandenburg between the Elbe and the Oder rivers in the Northern Lowland. Brandenburg had its beginnings as a military outpost on the left bank of the Elbe established

by Henry I, king of the Germans and duke of Saxony. This was the Nordmark or, as it was later called, the Altmark. It was not extended eastwards to the lowland of the Havel until the twelfth century, when the Slav fortress of Brannibor was selected as the site of a new German fortress, Brandenburg. Under Albert the Bear, the first of the Ascanian line, who came to power in 1133, the Mittelmark was established, extending east to the Oder. The districts of Priegnitz (Vormark), Ruppín and Uckermark, to the north of it, were incorporated into what became one large political unit of Brandenburg in 1157. Each of these territorial units had its nucleus in a raised platform of land that could be cultivated and settled, and was separated from its neighbours by low, flat lands that were marshy and wooded. (See Fig. 13.) In the fourteenth century the Neumark, a territory beyond the Oder, was added, and this, together with the Uckermark, served as an outpost against Slav Pomerania, just as the districts of Lebus and Sternberg to the south served as outposts against Slav Lusatia. The importance of the territory was evidenced in 1351 by the recognition of its ruler as an elector of the Holy Roman Empire. It remained, however, a poor frontier province. In 1411 the land was passed to Frederick of Hohenzollern when its own ruler became Emperor of the Empire. The Hohenzollerns came from Swabia and the first of them was derisively described as the "toy-maker of Nuremberg". But it was they who built the strength of Brandenburg and its successor, Prussia.

Expansion from the nucleus of Brandenburg under the Hohenzollerns began in the seventeenth century. In 1614 Cleve and Mark on the lower Rhine and Ravensburg in the Weser uplands were annexed. In 1618 East Prussia was added, when Albert of Hohenzollern, the Grand Master of the Order of Teutonic Knights, died without heir, and the land passed to the electors of Brandenburg as next in succession. The electors shortly after assumed the title of Kings *in* Prussia, since the land of East Prussia lay *outside* of the Holy Roman Empire, and the name Prussia was gradually assumed as the title of the Hohenzollern lands.

Brandenburg and East Prussia were gradually linked with the nucleus by the addition of intervening territories. East Pomerania was acquired in 1648, West Prussia and Ermland in 1772, Danzig, Thorn, and Posen in 1793, Swedish Pomerania in 1815. To the southeast, Frederick the Great acquired Silesia by conquest in 1742, and this land was still at that time overwhelmingly Slavic in history, people and culture, though Slavic traits waned before Germanic infiltration during the next generations.

Expansion also took place westwards, though it was more gradual and piecemeal. The ecclesiastical territories of the bishops of Magdeburg, Halberstadt and Minden were added in 1648. East Friesland on the north coast was added in 1744, and the bishoprics of Hildesheim, Münster and

Paderborn in 1803. All these territories west of the Elbe were lost to Napoleon temporarily in 1807 but recovered in 1815. But great changes had been made in this short period. It was then that Prussia formed the two new provinces of Rhineland and Westphalia in the lower Rhinlands within a political framework that had already been established by the French. Finally, the Rhinlands were linked with Brandenburg by the addition of Hanover, Kurhesse, Nassau and Frankfurt in 1866.

It is natural that in appraisals of the modern development of Germany, special attention is always given to the development of Prussia, since it accounts for two-thirds of the area of the population of the pre-war Reich and has had a dominant voice in its policy for a hundred years. The story of the spread of Prussia from its nucleus in Brandenburg in the Northern Lowland, and northeastwards to Prussia, southeastwards to Silesia, and westwards to the Rhinlands, has often been told. But the role of the lesser units receives only minor consideration in these appraisals. We also lack space to do just this, but at any rate we can draw attention to the importance of these units as contributors to the development of modern Germany. The two chief of these are undoubtedly Saxony and Bavaria. The Rhinlands as a whole also play a distinctive role in the development of modern Germany.

SAXONY (Fig. 55)

The State of Saxony is the most densely populated province of Germany with 347 persons to the square kilometre in 1939. It is a poor land with a rigorous climate and poor soils, that were thickly wooded before man's appearance. In the Erzgebirge today there are densities of 92 persons per square kilometre in the higher altitudes between 900 and 700 metres, 130 to 90 between 700 and 400 metres, and 600 to 200 below the 400-metre contour. Settlers were first drawn here by the attractions of its silver and secondarily of tin, and it was the descendants of the miners who, in spite of the abandonment of these workings, continued to live here by pursuing other occupations not connected with the soil. Here is an outstanding example of the emergence of a numerous population that has found subsistence through its diligence and enterprise in an environment unfavourable for the growth of foods in adequate quantities. The whole territory has become a hive of modern industry and the products of its farms only supply a small fraction of its food requirements. It depended throughout the first three-quarters of the century on the running water of its many streams. In the last fifty years or more it has profited by the proximity of coal- and lignite-fields in the lowland to the north. It derives electricity from the thermal plants on these fields as well as from its own hydro-electric sources.

The Slav population settled in the first millennium in the open loess areas on the northern border of the wooded highlands. We hear of a Sorab (Slav) duchy in the seventh century that reached west to the Saale. The Germans made their first entrance in the area east of the Elbe and the Saale under Charles the Great in 805 when the *limes sorabicus* was established from the Danube at Regensburg to the Saale. This was a series of outposts rather than a zone of fortifications, that joined up with the *limes saxonicus* to the north. The forested highlands of the periphery of the Bohemian Massif were avoided by Romans, Celts and Sorabs. The two chief routeways lay at its extremities, one through the Moravian Gate and the other through the Thuringian Highlands up the Elbe and Saale. Nevertheless, there is evidence that routeways between were early used by the Slavs.

German penetration was slow and continued from the tenth to the thirteenth centuries. Marches were established in the tenth century, with centres at Meissen on the Elbe, Merseburg and Zeitz. These three centres became bishoprics in 962. All these lands were much subdivided among conflicting German lords and disputed by the Slavs. Out of this welter there emerged one strong ruler towards the end of the eleventh century in one Conrad the Great, the first of the long dynasty of the Wettins, with which the fate of Saxony has long been associated. In 1123 the three marches were combined under Conrad into the margrave of Meissen (on Elbe) and in 1136 the margrave of Lusatia was added. Close settlement by Germans from Thuringia and Franconia took place in the following centuries. Cistercians also participated in this movement of colonization. The *Grundherren* early relinquished their rights and their lands were subdivided among the peasant communities or governed by a representative, a *Meier*, to whom the peasant owed his feudal dues. The peasant was never far removed from the prince since the territories were much subdivided. The Slav language did not disappear until the fifteenth century.

Mining of silver began in the Erzgebirge in the second half of the twelfth century, and population grew prodigiously and the Wettinian rulers became rich through the wealth of the mines. In the fourteenth century Saxony emerged from the chaos of divisions, its name being derived from one of the small lords of Thuringia who called himself the Landgrave of Saxony after the Saxon lands to the north. The Wettinians were Margraves of Lusatia, Thuringia, and the county palatine of Saxony (at Eisenach), and lords of Osterland (Leipzig) and Pleissnerland. These territories extended from the Harz to the summits of the Erzgebirge, and from the Werra to the Oder rivers. In the fifteenth century the Wettinian dukes of this great territory became one of the seven electors of the Emperor of the Holy Roman Empire.

The University of Leipzig was established in 1409 and in 1502 a second university was founded at Wittenberg as a Protestant university, since Leipzig clung to the Catholic faith. It was in 1485 that the Wettin line divided into the Ernestine in Thuringia and the Albertine in Saxony. It was the latter who founded the University of Wittenberg. Luther lived and worked at this university. His criticisms of the Church resulted in unexpected riots among the peasants and artisans in many parts of Saxony against the corruptions of the Church. He endeavoured to suppress these uprisings by maintaining the rights and privileges as well as the responsibilities of the nobility. Anarchy came in 1520 when attempts were made to break away entirely from both secular and ecclesiastical authority and to establish the "kingdom of Christ". Luther spoke from pulpits throughout the land of Saxony against these revolts and their aims. These troubles settled down in 1524-5 and were concluded by Luther's exhortation to both people and prince in his *Ermahnung zum Frieden*. This movement had its parallel across the Erzgebirge in the Hussite movement of Bohemia.

The extensive Wettinian lands were divided by a dynastic division into the lands of the Albertine in Saxony and the Ernestine in Thuringia. The former espoused the cause of the Emperor in the wars of religion and also enjoyed great wealth and power from the metal-workings that reached their peak in the later Middle Ages. In the mid-sixteenth century the Saxon territories were expanded by the addition of the episcopal lands of Merseburg, Zeitz and Meissen, and the secular lands of the Vogtland.

The mining of metals declined and petered out during the sixteenth century. The first steam-driven machine was brought to Zwickau in 1820. Production of coal reached the modest figure of 1 million tons in 1845 and the first short railways in the area were designed to link the fields with the towns. Coal production reached 2 million tons in 1858 and increased very slowly to 4.8 million tons in 1900 and 3.4 millions in 1938. This great hive of industry did not grow on the basis of local coal. It depended right down to the last quarter of the nineteenth century on the running water of its many streams. Steam power was installed in factories to displace the water-wheel and one may still see the isolated factory alongside the stream with the coal-fed power plant alongside it. Still more recently hydro-electricity and thermal electricity have come into use. Most of the coal mines were small concerns and there was no effective integration until after World War I. The number of miners in 1870 was a fifth of those employed in the Ruhr and one-tenth in 1900. Moreover, the miners are recruited mainly from the local population and many of them continue to hold some farmland; they are not entirely divorced from the soil. The total population of Saxony reached 1.2 millions in 1815 and rose slowly to 1.5 millions in 1871, then increased

rapidly to 4·8 millions in 1914, and 5·2 millions in 1939. This is a highly industrialized land, that employs both male and female labour. Twenty-eight per cent of its actively employed persons are engaged in the manufacture of textiles, 15 per cent in engineering industries (that are mainly highly skilled and refined fabricating industries) and 23 per cent in commerce (an unusually high proportion).

The progressive and "liberal" views of its people, as reflected in the wars of religion in the early sixteenth century, recur in social and political developments in the late nineteenth century. There is here a long tradition of co-operation and mutual aid. This is evidenced in the small co-operative enterprises of the medieval miners, and in the groups known as *Knappschaften* that developed among the workers in the Zwickau district in the sixteenth century. Miners' associations developed in the 1860s and two men, Bebel and Liebknecht, founded in 1874 the *Verband Sächsischer Berg- und Hüttenarbeiter*. Bismarck attempted to prevent such organizations and strikes in 1878, but this did not stop strikes of the miners in 1870 and 1889. Bebel and Liebknecht, who suffered imprisonment for their cause, laid the foundations of German socialism. Here, too, was established a workers' educational society, *Arbeiterbildungsverein*, in the towns, that was a fertile medium for the spread of socialistic ideas. The Social Democratic Party was founded in 1874 and its paper *Vorwärts* was founded in 1875. The party drew much of its philosophy from the teaching of Marx, but rejected the methods of revolution and of internationalism and concentrated its attentions on the peculiar social needs of the German people. After this period of incubation, as it were, among the progressive workers of Saxony, the movement spread throughout the Reich, and found its adherents especially in the Rhinelands and above all in the lower Rhinelands, where an urban proletariat rapidly accumulated after 1870.

BAVARIA (Fig. 55)

The modern State of Bavaria, second in size and numerical strength to Prussia, with a long and independent political tradition, is a seat of conservatism, just as Saxony has been a seat of liberalism. This is based in large measure on the character of the livelihood of these peoples in a different environment.

There is a sharp cleavage in modern Bavaria between the northern territories of old Franconia north of the Danube, that are Protestant in faith, with many small towns and a highly developed industry, and open to Latin influence from the Rhineland; and the southern section in old Bavaria, dominantly agricultural with a conservative peasantry, that is staunchly Catholic and far removed from outside influences. The density of population of 108 persons per square kilometre is one of the lowest

in the Reich. Farms are large in Upper and Lower Bavaria, where holdings of 20 to 100 hectares make up 40 per cent of the total, as compared with only 4 per cent in the Neckar lands of Württemberg and the Black Forest in Baden. Bavaria is also a land of numerous small towns, to which Munich, the overgrown capital, and Nuremberg, a half-million city, are exceptions. Indeed, the latter characterizes the country by the dominance of small skilled industries and small plants with personal relations between patron and artisan. In the typical small country towns there is a remarkable balance of occupation and opinion. There is very little aristocracy of wealth or station. Farmers, craftsmen and small traders, clerics and teachers intermingle among what is predominantly a *Klein Bürgertum*. Moreover, there has been very little immigration from outside, for Bavaria has had little to offer in the way of employment. In fact, its own high birth rate has not only maintained its growth, but has supplied considerable numbers of emigrants.

The first seats of settlement in the south were in the warm and fertile lands of the Neckar and the Main valleys. It was to protect these lands that the Romans erected the *limes* from near Coblenz, along the east side of the Neckar, along the Altmühl river, and thence to the Danube near Regensburg. This was designed to keep out the marauders from the *Hercynia Silva* in inner Germany. These fortifications, partly built of stone (and known to the Germans as the *Teufelsmauer*, the devil's wall), were strengthened by forts (*castellae*) and on them too were trading posts (*canabae*). Farms lay behind them (*villae*) in what was described as the *Agri Decumates*. Routes ran through this country to the trading posts on the frontier where goods were exchanged with the Slavs, who brought such articles as amber, honey and fur.

The German tribes invaded these German lands by crossing the fortifications. The Swabians and the Alemanni invaded and settled the southwest in areas that have been shown on Fig. 54 (p. 324). In the fifth century the folk known as the *Baioarii*, meaning the inhabitants of Bohemia, left that land and passed down the Naab lowland to Regensburg and installed themselves on the plateau west of Regensburg on open loess land. Their area of settlement is shown in Fig. 54. From this area they rapidly spread a thin veneer of settlement during the eighth century to Austria, Styria, Carinthia, and over much of the Alps. In the eighth century they were conquered by the Franks and in 788 they were incorporated in the Frankish Empire as the dukedom of Bavaria. Churches were founded and spread eastwards. St. Boniface founded the bishoprics of Passau, Regensburg, Freising and Salzburg, and consecrated many monasteries in the eighth century. The Slavs had not occupied the Bavarian Plateau, for their westward spread had been held up by the forested highlands of the Bohemian Forest and the Franconian Jura.

Marches were created against them and against the influx of nomadic marauders up the Danube valley. The Ostmark was founded in the ninth century and Vienna was founded in 1107 as the last in a series of town foundations along the line of the Danube. The Nordgau was created as a *mark* north of Regensburg between the Bohemian Forest and the Franconian Jura in 955, but after a few years it was annexed to Bavaria and became an integral part of it. After the defeat of the Magyars in 955 Bavaria extended eastwards and soon reached from the southern Tyrol to the Fichtelgebirge, between the rivers Lech and Enns, and from the Bohemian Forest to the Franconian Jura.

In the sixteenth century, Bavaria was a weak state, for the dukes of the Wittelbachs had little control over the many small authorities in their lands. They lost their electoral rights in the fourteenth century and yielded the Tyrol to the Habsburgs. But further disintegration was checked by the adoption of the law of primogeniture in 1506. The land was hopelessly divided by the numerous small authorities of lords and towns. Renewed strength came, however, in the seventeenth and eighteenth centuries with the Counter-Reformation, for Bavaria remained Catholic. The University of Ingolstadt was founded in 1472 and it became a pillar of Roman Catholicism and a citadel of the Jesuits. The latter were leaders in the Counter-Reformation that was strong in Bavaria and is reflected in the great activity of church-building in the Baroque style in this era. Revival of political power accrued to the dukes of Bavaria, who once again became electors, and received from the Emperor the territories of Oberpfalz and Kurpfalz in 1628. The Thirty Years' War spelled devastation. The armies of Gustavus Adolphus ravaged the land. It again became a battlefield in the eighteenth century. Order was restored and reforms introduced by Maximilian-Joseph (1745-77) who codified the Bavarian law on the basis of Roman law. He also turned his attention to the reclamation of the bogs along the Danube, as the Prussian kings were doing at the same time in the valleys of Brandenburg.

Then came the Napoleonic wars. Under the Napoleonic regime, in 1803 Bavaria was given the bishoprics of Würzburg, Bamberg, Augsburg, Freising and Passau, and fifteen free cities. In 1805 Augsburg, the Tyrol and Vorarlberg were added and in January 1806 Napoleon appointed the Elector Maximilian-Joseph as *King*. The new kingdom entered the Confederation of the Rhine in 1806. Salzburg and the Innviertel were added from Austria in 1810 and the territories of Bayreuth, Ansbach and Aschaffenburg to the north were added in exchange for the Tyrol and Vorarlberg that passed to Austria. The interesting thing here is that the territories that are juggled retain their outline; they persist as geographical units though passed from one political entity to another.

The real ruler in the French kingdom of Bavaria was not the king but his chief official, a Frenchman called Montgelas, the Bavarian Stern. He reorganized the political divisions, on the pattern of those of Revolutionary France. The old names were abolished and in place of all the complicated territories several major divisions were formed comparable with the French Departments with the names of Nordbayern, Südbayern, Westbayern and Ostbayern, and these were in turn divided into fifteen *Kreise*, comparable in function (and name) with the French *arrondissements*. Local autonomies were abolished, and government centralized in the capital at Munich. The old town militias were abolished and in their place a State army was organized. Education was also reorganized. The Constitution of 1808 was modelled on that of France. It introduced social equality, political liberty, religious freedom, the elimination of the last traces of feudal dues, and the secularization of ecclesiastical lands and obligations. Confiscation of religious properties and certain other measures were resented by a conservative peasantry who rose in revolt. In 1815 French influence was eliminated, but the reforms remained. In this short period, the spatial organization of Bavaria had suffered profound changes in the 'arrangement and organization of its political divisions as well as in its social structure. The limits of the kingdom in 1815 are shown in Fig. 56 (p. 335).

Bavaria has suffered no profound economic or social change in the modern period. But it has been very conscious of its political independence, jealous of its rights, and conservative in its attitudes. The land has remained dominantly agricultural. Its people are predominantly farmers. New industries, however, were introduced that sought to strengthen its economic foundations. Under Montgelas and later, industries such as leather-making, sugar manufacture (from the newly introduced sugar beet), metal-working, brewing and the making of textiles (as at Augsburg, where they were very old-established) were developed in Munich and Nuremberg and many of the lesser towns. These towns also have industries closely allied to their immediate market areas. Bavaria entered, though tardily, the customs union of the German states under Prussian leadership in 1835. Interest was directed to hydro-electric development in the Alps in the 'nineties. The farm holdings remained in their outline much as they had for centuries and the three-year rotation is still generally practised, modified by the introduction of new crops such as beet, potatoes, and grasses, with increased specialization in recent decades on dairying. The population increased very slowly in the nineteenth century. In 1806 it reached 3 millions, and in 1910, 7 millions, and 8.3 millions in 1939.

Bavaria has two distinct regional groups, as we suggested at the outset, the north and the south—Franconia in the Main basin, acquired in

1815, and old Bavaria. Slow to participate in the changes of the growing Reich under Prussia, and, indeed, always jealous of the power of Prussia, Bavaria entered the Reich in 1871 with the reservation that she should control her own army, railway and postal services. Naturally, Bavaria was also violently opposed to Bismarck's religious policy. Similarly its conservatism caused it to be opposed to the Weimar Republic and the separatist movement was strong. Yet it was here, in its capital, that the Nazi movement was nurtured. This fact is to be associated with the prevalence of reactionary governments in the inter-war period, while the monarchical tradition of Bavaria became increasingly opposed to the liberal trend of the Weimar Republic.

THE RHINELANDS

The Rhine and the Danube formed the frontier of the Roman Empire, with the exception of the area in the southwest that lay behind the fortifications of the *limes*. Behind these fortifications lay the basin of the Neckar and the western section of the Bavarian Plateau. Bishopricks were established on the western banks of the Rhine-Danube on the site of preceding Roman settlements, as bases for the Christianization of the lands to the east. This was the medieval *Pfaffengasse*, the route of the priests. Here was the heart of the Frankish Empire and of the Merovingian and Carolingian Empires. Here, too, medieval culture in the German lands reached its highest florescence. Here, for instance, some of the earliest universities in Europe were established, such as that at Cologne, that drew students from a wide area in northwestern Europe. Here, too, mechanical printing had its beginnings. Gutenberg produced the first printed works at Mainz and printed the first Bible. The first work to be printed in French came from a press in Cologne in the 1460s. Erasmus moved from Rotterdam to Basel in 1514 where he carried on his teaching. Luther was arraigned before the Imperial Diet at Worms in 1521, although his teachings and his influence began, and were most intimately concerned, with events in the University of Wittenberg and the land of Saxony. The Romantic movement seized the Rhinelands and found expression through many of the *savants* of the time. The *Aufklärung* of the eighteenth century, with its greatest thinker in Voltaire, found deep roots in the Rhinelands. Especially in the electoral courts did one find the splendour of France assiduously sought after and imitated. The Palatine Elector shifted his capital from Heidelberg to Mannheim, the archbishop of Trier built his new palatial residence at Coblenz, and the archbishops of Cologne built sumptuous residences at Bonn and Brühl, a village a few miles southwest of Cologne. There was a veritable diffusion of French culture. French was the language of the court and

French players performed for court and nobility. "Mobilier et mode, cuisine et philosophie" were affected by France. Goethe, it should be recalled, was born of a simple burgher's family of Frankfurt and was educated at Strasbourg. Heine, a disciple of Goethe, was born at Düsseldorf and educated at the State University of Bonn, though he soon left for the free atmosphere of Paris. The love of liberty of such men was suppressed by Prussianism that practised and fostered a militant and over-conscious nationalism that sought to drive out foreign, and particularly French, influences in thought, ways, and speech. This was the Rhenish *Anschluss*. To this day, however, the German Rhinelands have remained staunchly Roman Catholic lands of small land-owning peasantry, lands of a *Klein Bürgertum*. Charitable organizations within the Church applied themselves in the nineteenth century to social welfare and the relief of poverty. Thus there emerged the organized strength of the Catholic Centre and of the Christian Socialist parties.

Political and religious schism, however, early divided these lands. The Low Countries split on the religious issue, for it was primarily in the cause of religious freedom that the United Provinces fought for their independence of the Holy Roman Empire, whereas the southern portion of the Netherlands—the Spanish Netherlands—remained Roman Catholic. Moreover, after 1648 the Rhine became a barrier in that section where France reached the Rhine in Alsace. Here Strasbourg was made into a great fortress by Vauban, other forts were erected, and Mannheim was razed to the ground on several occasions. French control during the Napoleonic era spread throughout the Rhinelands. From Alsace to the United Provinces the frontier impinged on the "feudal menagery" of the Rhinelands, in which there were nearly one hundred separate states with their own courts, their own fiscal systems and tariff barriers, and the same general poverty and inequality among their peoples.

The Rhinelands were more effectively united under the political sway of the Napoleonic era. The Rhenish Convention voted for union with France in 1793 and the Rhine in its entirety below Basel became the eastern frontier of France. French rulers were installed in the German provinces throughout the occupied Rhinelands. Order was restored, peace maintained, and much attention was paid to the reorganization of political divisions, and the economic development of the occupied territories by the construction of canals, roads and the establishment of industries. The French Government of the Confederation of the Rhine effected rapid changes in these lands. The political pattern was reorganized and administration centralized. The Grand Duchy of Berg, for example, was formed by a regrouping of several territories—the duchy of Berg, the duchies of Cleve and Mark, and a part of the bishopric of Münster in the upper Ems valley. This area contained about one million

inhabitants. It was divided into four new departments called Rhine, Sieg, Ruhr and Ems. The administration was centralized with German prefects and sub-prefects. This system was introduced elsewhere in these occupied Rhinelands and was adopted by Hardenberg in the reorganization of these lands when they were absorbed into the Prussian State to form the two new provinces of Rheinland and Westfalen. In the same French era, feudalism was abolished, the *code civil* was introduced, and internal tariffs were wiped out.

At the same time the German people began to feel and develop their common nationality, as both an anti-Napoleonic and an anti-French movement. This was intensified after 1815. French words were driven from the German language, and there was a reversion from the influences of French Baroque art and architecture, such as had permeated the lands, especially the courts and the Church, in the eighteenth century.

The Rhine has been both a link and a barrier. The valley was followed by overland routes, long before the river was used. Prehistoric man used the routeways from across the Alps to the North Sea for amber, and natural overland routes ran along the *Börde* and these converged on the Rhine. A period of commercial prosperity under the Romans was followed by a thousand years of inactivity. A resumption of long-distance trade developed in the thirteenth century, with the opening of the route across the Devils Bridge at the head of the Reiss valley to the St. Gotthard Pass (1230). In the fourteenth century the fairs of Frankfurt acquired international fame for the sale of silks, spices, glass wares of the Orient and Italy; tin and lead from England; the fish of the Low Countries; and the cloths of Brabant and Flanders. Cologne also prospered. This trade declined after the discovery of the New World, but timber from the Black Forest was floated down from Speyer to Cologne, and salted fish moved upstream from Holland.

Gradually the river came to be preferred to the road. The merchants of Strasbourg at the time of the Hansas monopolized river-borne trade downstream to Cologne. At that time it took six to eight days for a loaded barge to sail from Strasbourg to Cologne, and a month or more to come upstream over the same course. There were numerous obstacles to navigation and upstream haulage was effected by horses. There were also numerous dues to be paid *en route*. Political disintegration of the lands on the river led to the use of the road rather than of the river. In the Middle Ages the Flemish ports were used as exits to the North Sea rather than the mouths of the Rhine. In the fifteenth century the main commercial thoroughfare quit the Rhine at Cologne and crossed country to Antwerp at the mouth of the Scheldt. In the eighteenth century this channel of trade shifted from Antwerp to Amsterdam. The lower Rhine, in other words, was not greatly used by traffic.

The Rhine began to function as a barrier from the seventeenth century. In 1814 Prussia reached the river. The east-west links in the Rhinelands were now dwarfed by the north-south links that developed with the improvement of the Rhine as a navigable waterway and with the unification of the German lands. The river was not of great significance as a waterway because of the shallows, rapids, and rocks on its course, and because of the numerous toll stations that impeded traffic. It was not until after the 'seventies that the great process of river improvement, *Strombau*, began. The German-Swiss Rhine was equipped for electricity undertakings at the valley constrictions. The Alsace-Baden sector was difficult to harness because of its rapid and shifting course, and the Canal d'Alsace on the west bank was built to bring Basel into direct touch with the main head of navigation at Strasbourg. The Palatinate sector was regularized between 1897 and 1913 with a depth of 2 m. 50, and seventeen meanders were cut and old courses abandoned. The "heroic Rhine" between Bingen and Bonn through the Rhine Massiff had to be cleared of rocks and narrows to a standard depth of 2 m. 80. Below Bonn more meanders were cut and a single channel was made with a depth of 3 m. 40. Rotterdam lies on the Lek, the main exit of the Rhine, the other less navigable exits being the Waal and the Meuse. The river was thus made navigable for large barges from Rotterdam to Strasbourg.

In 1815, the river was declared free to the vessels of all nations. This was extended to the Dutch sector in 1830 and to the whole river from Basel in 1868. The economic life of the river became international. Iron and coal became its main cargoes after 1850 and especially after 1870. Since 1900 potash has been sent downstream, and grain and oil have come in increasing quantities upstream, especially to the Ruhr. The river has been steadily improved. Barges with a capacity of 1,500 tons can reach Strasbourg. A great engineering feat was achieved that helped forge together the Rhinelands, and enabled a single channel to emerge in a river that had hitherto often had several entirely distinct and separate courses. Cities that formerly lay back from the river and avoided its dangers now sought river frontages for extension of port facilities. This vast traffic is catered for not only by the river but also by the canals that are connected with it on both its banks.

The nineteenth century witnessed the gradual economic and cultural unification of the German Reich. This was the age of the formation of the Zollverein and the first phase of the economic development of Germany. The real period of development came after 1870. This was the era of the *Strombau*, the improvement of the navigable waterways and the construction of canals. It was above all the era of the great Industrial Magnates. This was the *Gründerzeit*, the age of the founders. These founders of modern Germany were Friedrich Krupps (1787-1826) and

his son Alfred (1812-87), Friedrich-Alfred (1854-1902), August Thyssen (1842-1926), Hugo Stinnes (1870-1926) and Emil Kirdorf (1847-1926).

The Rhinelands have become the arsenal of German economic strength. These lands, however, have two cardinal disadvantages. First, they are dominantly Catholic, and, second, they are situated on the west of Germany next to France, and thus lie open to attack from the west. The latter undoubtedly stimulated the development of industry in the middle Elbe basin during World War I and after, since this region enjoyed the advantage of a central position in the heart of the Reich. But it is now absorbed into the sphere of Russian occupation and is only a few miles from the Czechoslovak frontier, and furthermore, since 1945, the whole area has been subjected to the spread of Russian communistic ideology. The Catholic and industrial areas of the Rhinelands, on the other hand, today constitute the new republic of West Germany.

MODERN REGIONALISM

The political structure of Germany has been fundamentally changed since 1945. Let us here concentrate our attention on the regional question in the pre-war Germany.¹

The problem of regionalism in Germany is far more complicated than it is in either France or Britain, for the Reich had essentially a cumbrous federal structure that was dominated by Prussia. The problem is to establish a group of states within the framework of a single federation in which no single state shall enjoy a dominating position. This would mean the abolition of Prussia, that contains nearly two-thirds of the area and the population of the pre-war Reich, and raising its component provinces to the status of the other component states. It has long been agreed in Germany that such reorganization is needed. Disagreement has mainly concerned the status of Prussia within such a federation. The Allied occupation has gone a long way towards the solution of this problem, for Prussia has been abolished and new federal states have been established.

There is, however, another side to this problem. It is that of dividing the Reich into provinces approximately equal in population and compact in area, so as to serve as effective units of government within themselves and in a federal government. In 1933 there were seventeen states in the Reich. Of these Prussia had fourteen provinces, if we include the city of Berlin and the small outlying province of Hohenzollern that is buried in the heart of Württemberg. Excluding these two, each of the provinces of Prussia had an average area of 25,000 sq. km. and a population of 3

¹ See R. E. Dickinson, *Regions of Germany*, London, 1945, and A. Brecht, *Federalism and Regionalism in Germany*, Oxford, 1945.

millions. The remaining states ranged from Bavaria with 78,000 sq. km. and 7.8 million inhabitants, to Schaumburg-Lippe with 340 sq. km. and 50,000 inhabitants (1933). Also in this list were the free cities of Hamburg, Bremen and Lübeck. Some of these states had many outlying, detached segments buried in the midst of lands of other states. All these units have long enjoyed the full apparatus of independent governments, and formed the basis of the federal Reich in 1871. Fig. 57 (p. 368).

Various changes were introduced in this pattern under the Nazis in the period from 1933 to 1939 and then during World War II. The new state of Mecklenburg was formed by the combination of Mecklenburg-Schwerin and Mecklenburg-Strelitz in 1934, and Lübeck was incorporated in the province of Schleswig-Holstein in 1937. The single unit of Hansastadt Hamburg was created in 1937. There were also changes in the provinces of Prussia. Lower Silesia and Upper Silesia were combined to form one province in 1938. The province of Saxony was divided into the two provinces of Magdeburg and Halle-Merseburg in 1944, each being co-extensive with the government district (*Regierungsbezirk*) of that name. Hesse-Nassau was divided into the two provinces of Kurhessen (the government district of Kassel) and Nassau (the government district of Wiesbaden) in 1944. The county of Schmalkalden was also transferred to the Erfurt district.

The economic and social changes in Germany since 1871 brought new associations and circulations that cut right across many of the state boundaries and made them sheer anachronisms, inconvenient and often inefficient and expensive to maintain. They could not be used as units for federal administration. And many state functions could not be carried out in the smaller states without the aid of their larger neighbours. Citizens often had to travel many hours to their state capital, although the capital of a neighbouring state was close to them. The maintenance of the parliamentary machinery was also very expensive in a small state, that was often smaller in area and population than an English county.

It was for these reasons that new and more rational consolidated divisions were established for many aspects of Reich-wide government and for regional trade and professional organizations. This problem was inevitably associated with the political problem and received much attention in the preparation of the Weimar constitution. It was also given a great deal of attention in the period from 1919 to 1933 by individual and public authorities. The outstanding contribution was that of the States' Conference held in 1928. A number of important changes were actually made in the political pattern in order to eliminate some of its absurdities. This work was continued by the Nazis. They created one single authority to cover the whole of the Hamburg urban area, calling it

Hansastadt Hamburg, and eliminated many small territories between Lübeck and Hamburg, as well as the independence of the city of Lübeck that was joined with Mecklenburg. They introduced many changes in the regional organization which will be noted below. The occupying Powers of the post-war Germany have carried the process further.

Among the schemes that were put forward in the 'twenties some were theoretical, prepared to serve the plans of the political philosophers who were more concerned with the constitutional aspects of the problem. Others were based upon single sets of criteria for the division of the whole country, or upon an exhaustive analysis of the regional integration of one portion of the Reich—such, for example, as the meaning and extent of Lower Saxony. Some schemes adhered closely to the political units, though eliminating the outliers and creating compact entities. Others created entirely new units, irrespective of political boundaries, by considering such criteria as traffic flows, tribal groups (*Volksstämme*), and cultural associations.

Professor Hugo Preuss prepared a new constitution for the Weimar Republic in November 1918. This was to be a federal state with sixteen Free States or *Länder* of roughly equal size, so that each had at least a population of one million inhabitants. The scheme failed because of the opposition of both the existing state governments and especially of Prussia. The question of the *Neugliederung* raised so many problems that it was shelved. The National Assembly, however, encouraged further research on the matter, and established to that end a *Zentralstelle für Gliederung des Reiches* in 1920, although it did little work and was abolished in 1929. The one important result was the creation of the unified state of Thuringia out of a notorious agglomeration of territorial fragments in 1920.

Other schemes were put forward. The Reich government called a conference of the leading ministers of all states in 1928. This conference declared itself in favour of the abolition of the dualism of *Reich* and *Land* and the formation of twenty-one *Länder*, of equal size and population, with the provinces of Prussia standing as states on the same footing as the rest. Another scheme was put forward by the *Bund der Erneuerung des Reichs*, founded by Reichschancellor Luther in 1928. In this scheme Prussia was to remain a single unit together with Thuringia, Mecklenburg, Hesse, and the two cities of Hamburg and Bremen. The other small *Länder* were to be absorbed into the neighbouring Prussian division to form five new divisions and in addition there were to be four provinces outside this *Reichsland*—namely, Saxony, Bavaria, Baden and Württemberg—each of which was to have a considerable measure of independence.

It is appropriate to mention here the work of the late Professor Walther

Vogel who in 1932, in summing up the literature on the subject, argued that in a new division the existing units should be adhered to as far as practicable, and that area studies be made in order to determine exactly the distribution of the relevant considerations, such as population, traffic, economic activities, social patterns and historical development. Each division he considered should be large enough in population to lead a balanced economic and social life. He lent support to the view that the cities of Hamburg, Bremen and Berlin should be independent units.

Since 1871 there has been much administrative devolution within the Reich and regional divisions have been adopted for many *ad hoc* purposes. Many of these were organized from Berlin and often cut right across state boundaries. This applied to finance, administration, social administration, control of waterways, education, and so on. This process established an administrative system directed from Berlin, parallel to, but independent of, the *Länder*, and it undermined and weakened the authority of the latter. As Vogel remarked, in respect of taxation, "Reich and Land are like a married couple, when the husband earns the money, the wife pays it out, but they do not tell each other what the income is and what the money is used for".

Among the numerous *ad hoc* divisions of the Reich several were of particular importance in the internal life and organization of the country. Among these we may mention the regional associations of chambers of commerce (*Wirtschaftskammer*). There were seventeen major provincial groupings that catered to the needs of all the industrial and trade concerns as well as for all employed persons. These provinces were East Prussia, Silesia, Brandenburg, Pomerania, Nordmark, Bremen, Lower Saxony, Düsseldorf (*Regierungsbezirk*), Westphalia and Lippe, Hesse, Rhineland, Central Germany (*Mitteldeutschland*), Saxony, Bavaria, Karlsruhe, Württemberg and *Regierungsbezirk* Sigmaringen, and the Palatinate. Within this provincial framework there were smaller component units (*Industrie- und Handelskammern*) that embraced all employed persons and cared for the interest of industry and trade. There were about one hundred such districts. Another group of important districts were the divisions of the Ministry of Labour, that handled questions of unemployment and insurance and general labour questions in each area. There were about three hundred and fifty small districts, that were grouped into thirteen major provinces as follows—East Prussia, Silesia, Brandenburg, Pomerania, Nordmark (Schleswig-Holstein, Hamburg, Lübeck, Mecklenburg, part of Oldenburg and the districts of Lower Saxony on the south bank of the Elbe opposite Hamburg), Lower Saxony (most of Hanover, Brunswick, Bremen, Oldenburg, Schaumburg, Lippe), Westphalia, Rhineland, Hesse, Central Germany, Saxony, Bavaria and Southwest Germany. Another division for the settlement of

trade and labour disputes (*Treuhänder der Arbeit*) was organized under the Nazi regime. Finally, mention should be made of the nation-wide division that has been used for some time for the general presentation of census material (*Wirtschaftsgebiete*). These provinces are—East Prussia, Pomerania, Berlin-Brandenburg, Silesia, Saxony, Central Germany (Province Saxony, Anhalt, Thuringia), Bavaria (with the Palatinate), North Elbe (Hamburg and Schleswig-Holstein), Lower Saxony, Rhineland-Westphalia, Hesse (Hesse-Nassau and the province of Hesse) and the Southwest. (Maps of these divisions are in the two works footnoted on p. 361.)

Many exhaustive studies have been made of the space relationships of each of these major provinces. There is a formidable literature on the subject of trade flows (*Verflechtung*). The Reich has been divided into homogeneous units on the basis of selected criteria in such a way as to provide areas that they considered would be suitable for a reorganized system of regional government. One of the more serious efforts was that of Professor Erwin Scheu (1927). (See our *Regions of Germany*.) He recognized twenty-two smaller districts and nine major provinces. His delimitation was based upon a careful study of the distribution of population, agriculture, industry and commerce, and his boundaries were drawn so as to correspond with the existing administrative boundaries. Another public administrator, A. Weitzel, put forward in 1928 a general division, based upon a detailed study of the sphere of influence of the city of Frankfurt-on-Main, and he defined his regions on this basis so as to form "the economic interests of the separate sections of the Reich, their geographical contiguity, their social structure, and cultural unity". Other such schemes took account of traffic flows, power consumption, and others were based on cultural criteria (*Stammeszusammehänge*).

The process of *ad hoc* division continued to be elaborated and a big step forward was taken under the Nazis. In 1936, the Reich was divided into twenty-three planning regions. These generally followed the existing frameworks, but the *Ruhrsiedlungsverband*, Berlin, and Hamburg, were separate units. Another unit of regional organization was established by the Nazis for the Party organization. This was largely based on the existing electoral divisions and the new districts were called *Gäue*. These were so defined as to be approximately equal in size, each with a well-developed sense of unity and with a dominant central headquarters.

The National Defence Regions differed from both the Party and the Planning Regions, although the National Defence and Party Regions became co-extensive in 1942. The former were described as economic regions (*Wirtschaftsbezirke*) and coincided with the Planning Regions or included two or more of them. To these new economic regions were allotted the regional offices for economics, food, and forests, and new

functions were subsequently transferred to them. These regions also became the units for the organization of commerce and industry. Thus, party regions, defence regions, and economic regions, became for the most part co-extensive, although they were different from the States and the provinces. Under this war-time organization, the political independence of the states was eliminated. They became administrative provinces directly controlled from Berlin, and the scheme was extended to the annexed territories. In each province the Party leader was in charge of the national administration, as well as of the home-rule administration of the province. But the basic problem of territorial reorganization of the German states remained largely unsolved.

CHAPTER 15

POTSDAM GERMANY, 1945-52

THE PURPOSE of the preceding chapters has been to portray the economic and political geography of the pre-war Germany viewed in the light of historical perspective. We may now evaluate on this background, some of the outstanding current problems of the new Germany, or rather, of the two new German Republics. Before doing so, however, let us first briefly review the trend of events during the period of occupation by the Allied Powers from 1945 to 1950.

The pre-war Germany is divided. There are the four zones of occupation, the jointly occupied area of Berlin, and the "separated area" beyond the Oder and the Neisse rivers. The last areas were handed temporarily to Poland in 1945, but they have been permanently incorporated into Poland, with the support of this *fait accompli* by the Soviet Union, but with the strongest disapproval of the Western Powers. The remaining fragment of the Upper Silesian coalfield has gone to Poland, so that the whole industrial complex is now in its territory. The Saar coalfield and its associated industries once again have been incorporated into the customs union of France, although the peoples, German in speech and traditions, retain an autonomous government. Apart from very minor adjustments of a few square miles, there have been no changes of the western frontiers.

ALLIED OCCUPATION, 1945-52

The Potsdam Agreement did not provide for immediate establishment of a single central German government, but did agree on the formation of essential central administrative departments for purposes of finance, transport, foreign trade, and industry, under the authority of the Allied Control Council. These decisions were not carried out. The Powers set up their own administrations in their own zones which in effect developed on different lines and stagnated in the water-tight compartments of the new and arbitrary zonal boundaries. Britain controlled the industrial northwest and the part that had been most severely damaged. This area stood in greatest need of foreign trade and outside aid, so that Britain was hard hit by this arrangement of separate zones. The victor had to maintain the vanquished. The economic merger of the British and American Zones was begun in the autumn of 1946 and



FIG. 57—POLITICAL DIVISIONS OF POST-WAR GERMANY (scale 1 : 6 m.)

[For key see next page]

Bremen and Wesermünde now form a separate *Land*, and the surrounding area of the Enclave has passed to Niedersachsen.

formally consummated on January 1, 1947. In February, 1948, there emerged a union of the British and American Zones for purposes of economic, financial, and legal administration, with appropriate German legislative bodies. The next step was towards the formation of a single ~~West~~ German State, together with the French Zone. The Basic Law of a new constitution was worked out by a German "Constituent Assembly" in 1948, and came into force in August, 1949, when the Federal Diet was elected ~~and met~~ in Bonn. At the same time authority was passed from the military government to an Allied High Commission as the supreme authority in September, 1949. Meantime, the Soviet Zone was being organized on the basis of separate ~~zones~~ and a central authority. The direct proclamations of the Soviet Military Administration throughout the whole zone did much to effect a more rapid recovery than in the Western Zones. The government was centralized through an Economic Commission (August, 1947) and by the end of 1948 an Eastern Zonal Government existed in fact if not in name. Thus, the creation of a legislative People's Council (*Volkskammer*) and Government in 1949 caused no big change in the system of government. The federal People's Chamber enacted a constitution in October, 1949 and shortly after the East German Democratic Republic was announced, by way of retort to the formation of the West German Federal Republic. The federal government in West Germany is described as "a democratic and social federal state", in which the federal government has control of foreign affairs, finance, personal movements (migration, passports, etc.), customs, railways and postal services.

New States or *Länder* were established in each zone and elections held during 1946. (Fig. 57.) Some of them were entirely new politico-geographic units, that correspond essentially with the "commercial" regions we have described. (Fig. 50, p. 281.) They are all based, however on the pre-existing political pattern, though many of the "inliers" and

Fig. 57. POLITICAL DIVISIONS OF POST-WAR GERMANY.

- | | |
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| 1. Easter frontier of Potsdam Germany | 3. Boundaries of new <i>Länder</i> |
| 2. Boundaries of the Zones of Occupation | 4. Boundaries of old <i>Länder</i> and Provinces of Prussia |
| Prussian provinces are: | |
| 1. Berlin | 5. Lower Silesia |
| 2. Brandenburg | 6. Hanover |
| 3. Pomerania | 7. Westphalia |
| 4. Saxony | 8. Schleswig-Holstein |
| | 9. Rhineland |
| | 10. Kurhessen-Nassau |
| | 11. Hohenzollern |
| Other pre-war <i>Länder</i> are: | |
| 12. Bavaria | 17. Oldenburg |
| 13. Wuerttemberg | 18. Mecklenburg-Schwerin |
| 14. Baden | 19. Brunswick |
| 15. Thuringia | 20. Anhalt |
| 16. Hesse | 21. Lippe |
| | 22. Schaumburg-Lippe |
| | 23. Bremen |
| | 24. Saar |
| | 25. Saxony |
| | 26. Hamburg |

Names indicate the Zones of Occupation and the new *Länder*. East of the Oder-Neisse boundary is under Polish administration (Separated Areas).

"outliers" have been abolished. There are fourteen of these *Länder*; namely, Schleswig-Holstein, Lower Saxony, North Rhine-Westphalia, and Hamburg in the British Zone; Hesse, Bavaria, Württemberg-Baden and Bremen in the American Zone; Rhineland Palatinate and Württemberg-Hohenzollern in the French Zone; Mecklenburg, Saxony, Saxony-Anhalt, and Brandenburg in the Soviet Zone. Berlin falls into a Western and an Eastern Sector. The British Zone embraces the main industrial area of the Lower Rhineland and the dairying area of Schleswig-Holstein; the American Zone the predominantly agricultural area of the south and the industrial clusters on the Rhine and in Württemberg; the French the agricultural southwest; and the Russian the whole of the great middle Elbe industrial area. Berlin is situated in the midst of the Russian zone. The Western Sector is a politico-geographical outlier of Western Germany, and the Eastern Sector is contiguous with the Soviet-occupied land. Western Berlin is not only cut off from the western state; it is also cut off from its surrounding hinterland, since this is held by the Soviets. There are differences also in currencies and politics between the Western and Eastern sectors that impede the healthy growth of Berlin and make the holding of Western Berlin both costly and inconvenient from the standpoint of both the Western Powers and the West German Federal Republic. Hamburg, it should be stated, is also cut off from its principal hinterland in the Elbe basin and Berlin by the boundary between the Western and the Soviet Zones.

The difference in the economic structure of the four areas into which the whole of pre-war Germany is divided is shown summarily as follows:

Population and Production in Pre-War Germany as per cent of total

	<i>Western Zones</i>	<i>Soviet Zone</i>	<i>Berlin</i>	<i>Separated Areas</i>
Population	58	22	6	14
Net Value of Agricultural Production (1936) ..	51	26	—	23
Net Value of Industrial Production (1936) ..	61	24	9	6

Moreover, since we have given the figures of occupations for the pre-war Germany, it is fitting to add here the similar figures for the post-war Germany and its constituent *Länder*. These are shown at the end of the chapter. Perhaps the most significant fact revealed in this table is the great increase in the numbers of unemployed, from 12.8 per cent of the total population in 1936 to 22.0 in 1946. In 1949-50 this figure has averaged about 10 per cent. This is due mainly to the enormous shifts in population through the westward movement of refugees, to which

we have already referred. The level of total unemployment in the West is still around 1.5 million (1.9 million in February, 1952) and the position has been described in an E.C.A. report as "explosive".

When the Allied occupation began in 1945 all government had completely broken down and economic activity was in chaos. The immediate task of the military authorities was to establish order and the speedy establishment of self-government by the Germans within the framework of new *Länder*. The initial plan of the Allied Control Council (March, 1946) sought to carry out the principles enunciated in the Potsdam Agreement. It prohibited the manufacture of armaments, heavy tractors, and most chemicals; and reduced the production of steel, light metals, machine tools, heavy engineering, trucks and passenger cars. The aim of the Potsdam agreement to "ensure in the manner determined by the Control Council the equitable distribution of essential commodities between the several zones, so as to produce a balanced economy throughout Germany and reduce the need of imports", failed dismally, since East and West steadily split further asunder. The key fact is that the original plan fixed the production of steel at a maximum of 5.8 million tons; this was closely in line with the Morgenthau plan to "pastoralize" Germany. The speedy recovery of Germany was essential to improve the lot of the Germans and to raise Germany from the status of a vast internment camp, supplied in large parts, by gifts of food from Great Britain and the United States. The permitted levels of industry have been repeatedly raised by the Allied Powers to fit with the trends of production.

All zones suffered from economic stagnation and social dislocation from 1945 to 1947. Industrial production in 1946 was a fraction of 1936-66 to 75 per cent in the Western Zones, and 33 to 40 per cent in the Soviet Zone—the big difference between East and West being due to the thoroughness with which the Soviets immediately carried out the Potsdam policy of dismantling of factories, whereas the policy has been carried out slowly in the west. Revival was hampered by the separation of interdependent industries by the zonal boundaries; by the lack of skills and under-nutrition of the workers; by the virtual elimination of normal foreign trade; and by the lack of the essentials of industry—coal and steel. Agricultural production was disorganized in 1945-46 and the black market was rife. There were catastrophic drops between pre-war and 1946-47 in the food *officially* available to the non-farm population. In 1947 the non-farm population of 33 million in the Western Zones was receiving only 1,000 calories a day, or less than a half of the pre-war figure. There was lack of food, coal, transport, building (or even the clearance of rubble), and an absence of the normal incentives to work.

Western Germany. The change in Germany's fate came with the announcement of General Marshall's scheme for aid to Europe in June,

1947. This was followed by the meeting of representatives from sixteen states in Paris in the summer of 1947 at which it was recognized that western Germany would have to be included in any scheme of European rehabilitation. Shortly after, the United States and Great Britain published their joint revised plan of industry for Bizonia, i.e., their combined zones of occupation (August, 1947). This aimed at raising the productive capacity per head of population to 75 per cent of the 1936 level. The goal of this policy was evident in the raising of the maximum steel production from 5.8 million tons in the first plan (March, 1946) for all four zones, to 10.7 million tons for Bizonia alone. Also the productive capacities of metal, machine, and chemical industries were raised. The dismantling policy, however, was to continue. In October, 1947, a list of 681 factories was published for dismantling in Bizonia, the two chief affected being electrical and machinery production. The London Foreign Ministers' Conference (25 November-15 December, 1947) agreed to the increase of the total steel production of all four zones to 11.5 million tons. The introduction of the revalued mark on 20 June, 1948 in the three western zones and the later revaluation in the Russian zone (23 June, 1948) marked a further step in the formation of two distinct Germanies. The conference of the Western Powers and the Benelux countries at Petersberg agreed on the formation of an International Authority for the Ruhr, with the task of preventing excessive economic concentration, protecting foreign investments, and distributing abroad a part of the coal, iron, and steel production. The six powers represented in this Authority are France, Britain, and the United States, each with three votes, and the Benelux countries, each with one vote. West Germany joined and has three votes. The tripartite Military Security Board remains as the only restrictive authority. The Petersberg agreement set western Germany definitely on the road of unrestricted industrial production. In return, the government of West Germany agreed not to rearm and not to re-Nazify its public life. Among other concessions, twenty-three factories were released from dismantling.¹

The acceptance of the Schumann plan (see below) will mean that the International Authority will be abolished, and German steel production will be freed of all Allied restrictions on production.

Western Germany has experienced a profound change during the three years of Marshall Aid and especially since the currency reform of June, 1948. Help between April, 1948 and February, 1950 reached one

¹ These include the great Thyssen works in Hamborn, that is normally responsible for ten per cent of Germany's steel production, the Charlottenhütte, and two synthetic oil plants; all of these are in the Ruhr. In addition, the Börsig electrical plant in the French Zone of Berlin is released. On the other hand, dismantling of the Hermann Göring works at Watenstedt-Salzgitter is to be carried out. This is an entirely new community of 100,000 people that is thus deprived of its livelihood, and has made strong public demonstrations against the Allied decision.

billion dollars. During this period industrial production increased from 60 per cent of the 1936 figure to 130 per cent in December of 1950. Value of exports has increased from \$300 million in 1947 to \$2 billion in 1950 and \$3.5 billion in 1951. So effective has this economic recuperation been that it is now officially reported that "the hunger level has been replaced by a standard of living which is little below that of pre-war years"—a fact that is borne out by the statistics of food consumption below. There still remain, however, formidable problems. Housing is one of the biggest, for probably one-quarter of the people (and a higher proportion of its families) are without their own separate dwellings. And this concerns the housing of the refugees of over 10 million from eastern Europe. Unemployment is still over 1,500,000, with nearly 300,000 of these in Berlin. It cannot be claimed that the federal republic is on its economic feet. It is threatened with financial crisis, and it is widely considered that this can only be overcome by curbing the powers of the *Länder* and concentrating authority at the centre. Marshall Aid is being extended through the Mutual Security Agency, indirectly for purposes of defence. But progress since 1948 has served to eliminate the spectre of hunger, to lay the foundations of a new western Europe with western Germany as a part of it, and helped curb the attitude of utter pessimism and inactivity that prevailed down to 1948. But a long way is to be travelled yet.

The most striking features in 1950 in western Germany were the remarkable improvement of employment and production. Steel production topped 11 million tons in 1950 (1938, 18 million tons); coal output was almost up to the pre-war level (1937, 117 million tons, 1950, 110 million tons); and lignite output exceeded the pre-war level (1937, 66 million tons, 1950, 75 million tons). The production of textile yarns (wool, cotton, and rayon) almost exceeded the pre-war level of production. Building activities, as indicated by the production of cement and bricks, doubled in the 1948-50 period. In 1951 they exceeded 1936 by nearly a half. The production of electricity in 1951 was more than double that of 1936. The numbers of employed in mid-1950 reached 13.8 million, with 1.1 million in agriculture and 7.5 million in industry, building and handicrafts (1951 av. 14.6). While industrial production had been absorbed in the domestic market down to the end of 1949, in the first half of 1950 this was almost equalled by the rise in industrial exports. In 1948 imports exceeded the pre-war level, and nearly 44 per cent of the imports came from the United States, as compared with 5.2 per cent in 1937. Exports in 1948 were 40 per cent of the 1937 level, and the proportion sent to the United States was substantially the same as in 1937 (4.7 to 2.5 per cent), while 85 per cent went to Switzerland (50 per cent in 1937). The volume of exports in

1950 went a long way to equalling those of 1936. The exports of July and August, 1950, equalled the 1936 level by volume. The greater part of this increase went to European countries (Netherlands, Belgium and Italy). About 70 per cent of West German exports are now going to western Europe, as compared with 56 per cent in 1936. In 1950 there was also a trend to the normal export pattern in the increase to eastern Europe and Latin America to their 1937 values. Export increases are mainly in engineering industries, and as long as the big rearmament drive continues this is likely to continue. Exports in early 1952 were double the monthly average for 1950! Agricultural production has made a marked recuperation. Index figures, with 1936 as 100, were at 97 for all grains, 114 for raw sugar, 64 for meat and 83 for milk for 1949-50 and the gross output is 87 per cent of 1936. (1950-1, 106.)

The facts of the situation as far as western Germany is concerned are basically clear. Western Germany was always dependent on foreign trade for much of its livelihood. On pre-war standards, it must import some 40 per cent of its food, as well as raw materials. Obviously it must try to produce as much of these things, or substitutes, as possible. It must also export its industrial goods far beyond the pre-war level in order to balance its budget and in order to give full employment to its great increase of population. The need, then, is, first of all, for a drastic reorganization of the tax structure, so as to spread the load more fairly and release funds for government revenue as well as for investment. There is need for the direction of this investment into industrial reorganization—rather than expansion, for the industrial capacity is, by and large, adequate, according to E.C.A. reports. There is need for an increased output of agricultural products, especially for the increase of the cultivated area through reclamation projects. Next, under the heading of industrial production in particular, there is need for a vigorous housing programme, in order that people can live where the factories are—a plain but vital statement of fact. Lastly, it is essential to balance exports against imports; and to solve the “dollar gap”, which is excessively large (practically all German imports since 1945 have come from the United States), by reducing the imports from that source, increasing the exports both to the dollar area and to the world at large. The complex pattern of German foreign trade has broken down and is in process of readjustment.

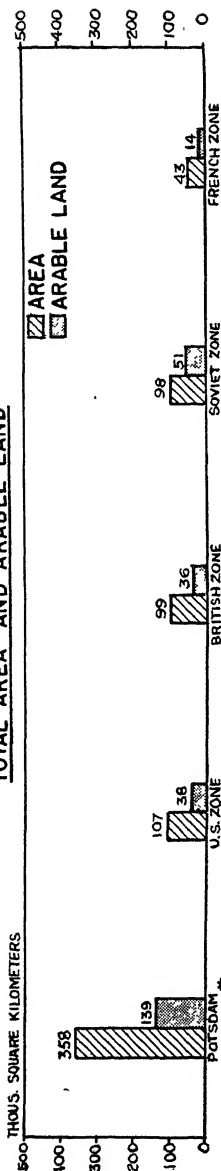
Eastern Germany. The Soviet-controlled zone is in the throes of a two-year plan which began on 1 January, 1949. Substantial progress has been made to date though the programme took off to a bad start. The lifting of the blockade permitted the zone to import machinery, iron and steel products, and chemicals from the west, and the Russians have overdrawn their trade accounts and stock-piled some items. Another

reason for recent headway has been the expansion of international trade. Coal, iron, petrol, and food, are now coming in from the east. It should be remembered that this zone is densely peopled and has inadequate resources of certain foods, manufactured goods, and raw materials. While it includes large agricultural areas, it also embraces the great industrial area of the middle Elbe basin noted above, that imported much of its foods from elsewhere, e.g. meat from Schleswig-Holstein that now lies in the British Zone. Russia has taken an immense toll from the zone. Factories were dismantled wholesale and completely shifted, railways almost everywhere were only left with one track, and the motor vehicle industry was shifted *en bloc* (five big plants). Moreover, until the time of the blockade reparations were at the rate of one-half of current output of industrial production. Large quantities of grain and other food stuffs were commandeered. Further, the occupation force had to be maintained and about one-fifth of the industry is directly controlled by the Russians.

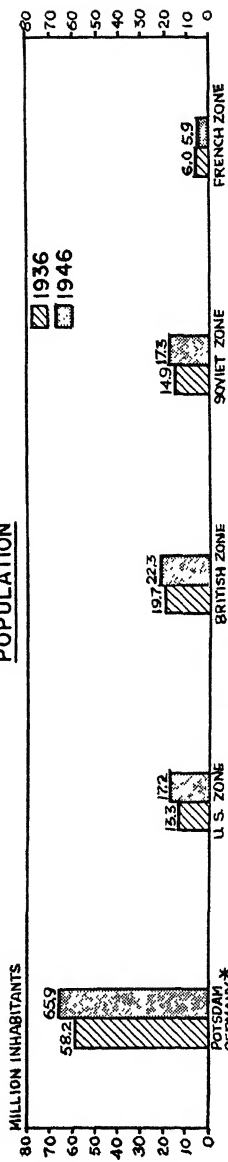
Much of this policy of exploitation, however, was reversed or slowed down when the Berlin blockade started—otherwise there would have been an economic collapse. Several small steel-rolling mills and plants have been restarted and the Soviet sent in iron, steel, grain, and fats. This policy seems to have continued since the end of the blockade. Thus, in the last year or more, big economic advances have been made. There has been a big increase in brown coal output (1948, 110 million tons, 1949, 125 million tons). Output of pig iron and steel doubled in 1949, and may be trebled by the end of the Plan, so that the zone should be able to dispense with imports of steel by the end of 1951. There has also been a large increase of production of textiles. About 130 industrial concerns are controlled by the Russians and are making goods for reparations to the extent of one-fifth of the labour force. Nationalized concerns include one-half of the workers. Level of industrial production was 134 in the first quarter of 1950.

There is likely to be little change in agriculture, however. The zone produced 3.5 million tons of bread grains before the war, and imported a further 750,000 tons, mainly from Polish Silesia. With calory consumption tied down (1950) to 2,100 calories (western zones about 2,500) consumption manages to keep in line with production, but the Soviet Zone will have to depend on imports for about one-tenth of its grain in 1951. Grain production is to show no change in acreage in the Plan and there is a shortage of fertilizers and machinery. The potato crop dropped from 11 million in 1948 to 8 million in 1949. The eastern zone, in other words, is going to remain dependent on eastern Europe for large food deficits for a long period of time. The large Junker estates have been broken up and subdivided among German refugees from

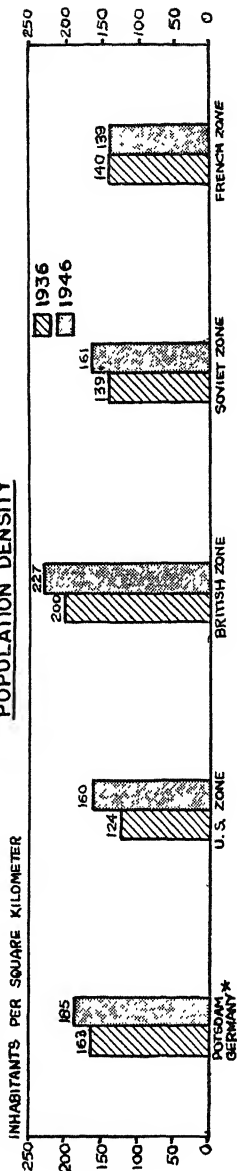
TOTAL AREA AND ARABLE LAND

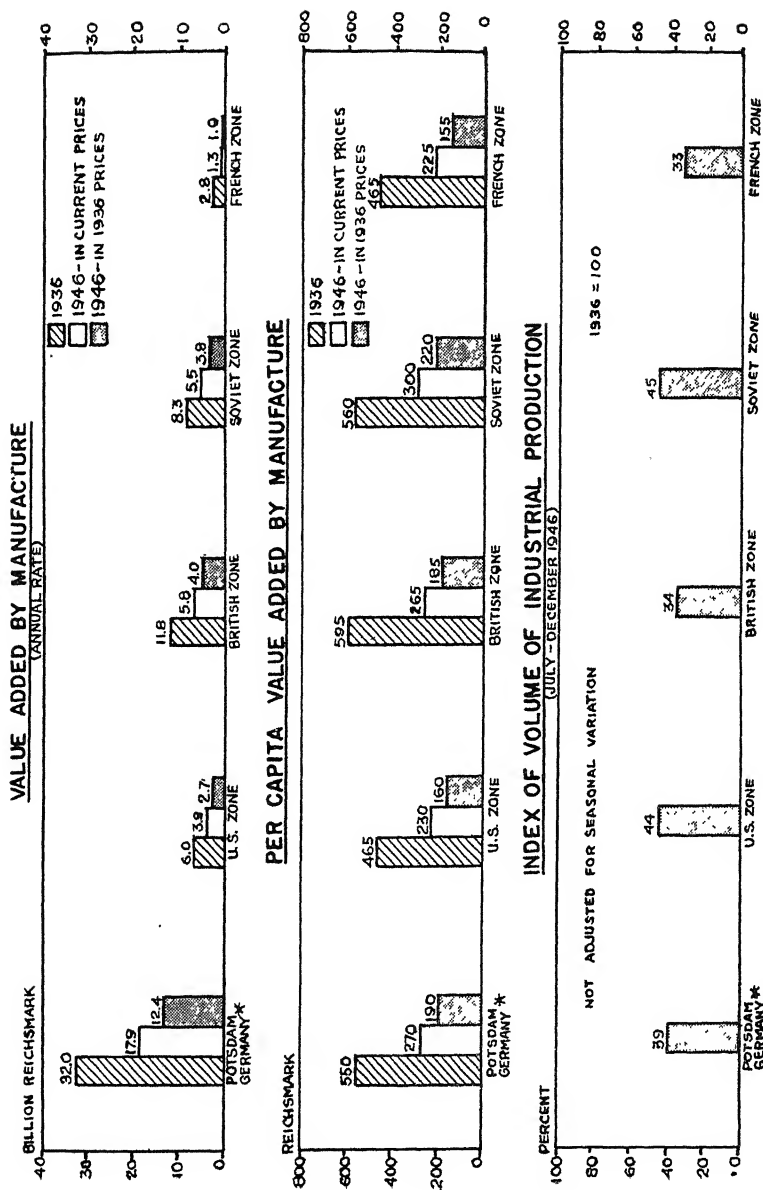


POPULATION



POPULATION DENSITY





* POTSDAM GERMANY INCLUDES BERLIN

FIG. 58—BASIC STATISTICS OF POTSDAM GERMANY BY ZONES, 1936 and 1946 from *Economic Data on Potsdam Germany* (Report of the Military Governor), September 1947

Poland, and many of the small holdings will undoubtedly be uneconomic. This may be part of a plan to speed up collectivization. The big farms depend on nationalized machine pools. "The zone is being rapidly sovietized and increasingly bound into the east European economy, while its dependence upon the western zones is diminishing." The level of agricultural production in 1950 was probably about less than two-thirds of the 1936 level, whereas in the western zones the recovery under E.C.A. has been rapid and dramatic, so that production there now exceeds the pre-war level and rationing has been abolished.¹

THE POPULATION PROBLEM

The Potsdam Agreement decreed the shift of about 6½ million Germans from the lands east of Germany, and the Powers decided on a rough division of quotas by zones for the receipt of the refugees—the Soviet was to take 2¾ million, the American Zone 1¾ million, and the British Zone the bulk of the remainder, from Poland. The French came out best, since they were to take the small quota from Austria. The mass expulsions, however, were far greater than this, for the western Allies had reckoned on Poland administering only temporarily the eastern areas, whereas the Poles took permanent possession by forcibly expelling some 9 million Germans. In the West, after these broad quotas had been laid down, the *Länder* had to arrange between themselves how they would divide their shares in each zone, depending on housing conditions, food stocks and job opportunities. The Potsdam Agreement ordered that the movements should be carried out in an "orderly and humane manner". This injunction was seldom obeyed. The refugees were expelled from Czechoslovakia, Poland, and Hungary *en masse* and arrived at the station depots in the *Länder* with no more than the clothes on their backs, and with an altogether disproportionate number of old and young, and few males. The Germans, on the other hand, carried out their obligations with typical thoroughness, and provided emergency rations to the arrivals and found some kind of shelter for them, with other families or in camps. The order to them was to "integrate the expellees into the German economy", although in 1946, when the wholesale mass expulsions were in full swing, often arriving at the rate of 40-50,000 a day, the German economy was at its lowest ebb. Moreover, the total number is far in excess of what the Potsdam Agreement foresaw. The refugee is one of the greatest social and economic problems for the new Germanies, west as well as east.

We recall an address by the economist Schacht at the centennial

¹ See "East German Recovery" in *The Times*, London, Feb. 9, 1950, and "Eastern Germany: A Survey of Soviet Policy, 1945-50", *World Today*, July, 1950.

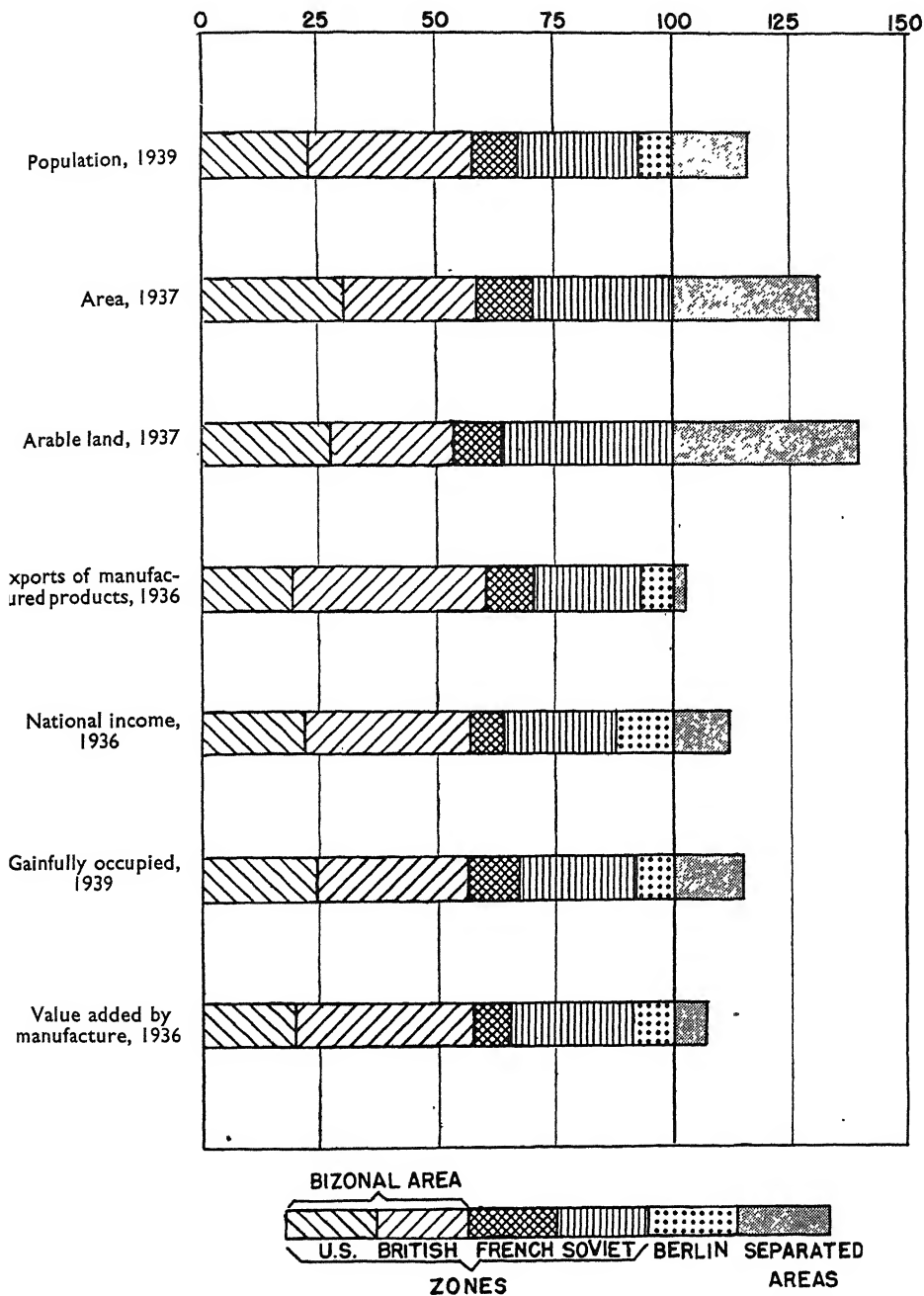


FIG. 59—PRE-WAR BASIC STATISTICS FOR POTSDAM GERMANY BY ZONES from *Economic Data of Potsdam Germany (Report of the Military Governor)*, September 1947

jubilee of the Frankfurt Geographical Society in 1937, in which he circulated a page of statistics to demonstrate that the Reich would have to expand or explode. This argument is much more cogent today. The enormous shifts of population in Germany in the last ten years present a problem that will take many years to solve. "Integration" is a slow process. But, in essentials, it can be simply stated. The population of Potsdam Germany, in spite of war losses of some 5.5 million, increased by 6.3 million or 11 per cent from 1939 to 1946, so that the density of peoples increased from 167 to 184 per square kilometre. On the other hand, the areas east of the Oder and the Neisse, in spite of the immigration of 3.5 million Poles, decreased by 4.5 million, so that the density fell there from 83 to 51 persons per square kilometre. This increase was mainly due to the influx of refugee Germans from eastern Germany (5.6 million) and central Europe (4 million) to the extent of nearly 10 million, the overwhelming majority of whom were in the British and American Zones. At the end of 1948 the refugees made up 60 per cent of the unemployed in Schleswig-Holstein, 30 per cent in Bavaria, 25 per cent in Württemberg-Baden and Hessen. There are then two problems—to provide these refugees with jobs, food, clothing, and shelter; and to provide the whole of the population with a standard of living comparable with that of its neighbours on a long-term basis. In July, 1948 there were 11.4 million refugees in Potsdam Germany, with 7 million in the Western Zones, and 4.4 million in the Soviet Zone. The total may well go up to 14 million. The bulk of the expellees moved into the country villages, since the towns were destroyed. The population of the rural districts increased in the 1939-46 period by 38 per cent and by 45 per cent to April, 1949. Thus, in the *Landkreise* of the British and American Zones, the following enormous increases are recorded for October, 1946—Schleswig-Holstein, 90 per cent, Niedersachsen, 55 per cent, Bavaria, 41 per cent, Hessen, 36 per cent, Württemberg-Baden, 31 per cent, and Nordrhein-Westfalen, 17 per cent. Some of the refugees are in special camps, but about 1.5 million are living in the most appalling slum conditions. About 2.3 million of the refugees share kitchen quarters with the "indigenous" folk. Another third live, cook, and wash, in one room. The food situation is also very bad, since the Potsdam Germany with about 70 million people—roughly equal to the number of the whole of the pre-war Reich—has lost 25 per cent of its grain production, thirty per cent of its sugar beet production, and 25 per cent of its meat production. The story is not yet complete, for out of the 65 million people in the four zones of Germany in 1946, in addition to the 10 million refugees, there were 3.5 million evacuees whose homes in the towns were destroyed; and nearly 1 million "foreigners" or "displaced persons". Another 2 million were evacuated inside their

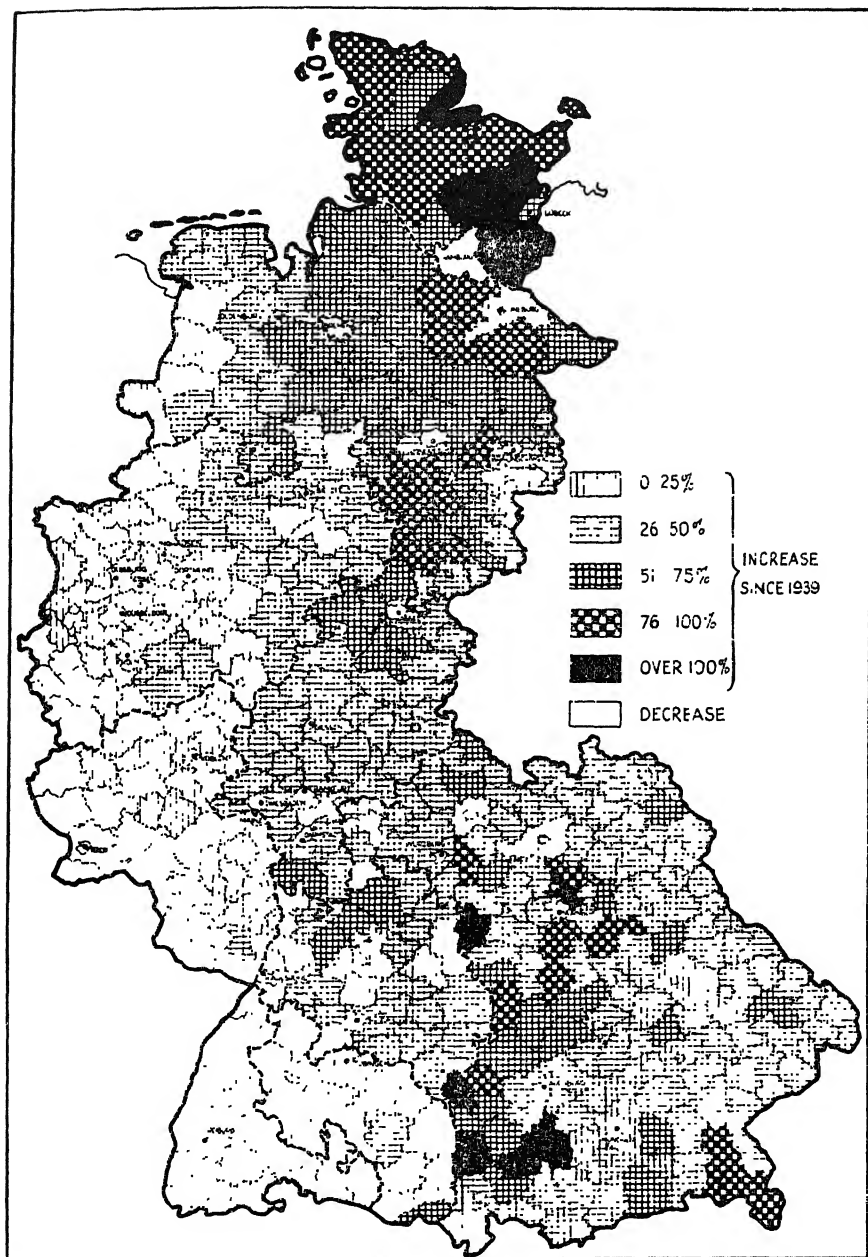


FIG. 60—WEST GERMANY: INCREASE OF POPULATION, 1939-46 (by *Kreise*)
 (scale, 1 : 5 m.)

own *Länder*. With prisoners and interned this means that about 20 million—between a half and a third—people are uprooted and without homes. Of the refugees in Bizonia 85 per cent in 1946 were in the country and only 15 per cent in towns, and in Bavaria, for example, over 40 per cent of them were in small villages with less than 5,000 people. Out of 545 *Landkreise* of the four zones, only 49 record a decrease in the 1939–46 intercensal period and most of these were in the French Zone or on the eastern border of the Russian Zone. Many areas have an increase of 25 to 50 per cent. In Schleswig-Holstein almost all of the *Landkreise* increased by over sixty per cent, whereas most of the towns recorded a decrease.¹ (Figs. 60 and 61.)

This situation gives rise to a multitude of social and economic problems involved in the absorption of these people into the life of their new neighbourhoods and the *Länder*. The economic and social structure of the village is being radically changed. The general problem of attaining a reasonable standard of living is tied up with the questions of an increased productivity of farming and the growth of industry with a maximum of skills and a minimum of imported raw materials. And above all the refugees must have work, either unskilled or fitted to their particular skills. Provision must also be made for the many disrupted families, the aged, the infirm, and children.

Germany's housing problem is so enormous that it presents a major task of physical planning for the next fifty years. In 1939 there were 16 million dwellings in the four zones and 10.5 million in the three western zones. Four million dwellings were destroyed and 2.5 million damaged. Taking the former figure, there remain 12 million dwellings in all Germany and 7.5 million in the western zones. It is reckoned that in mid-1948 there were 6.3 persons per dwelling in Trizonia, 4.7 in the Soviet Zone and Berlin. For Trizonia, this amounts to 1.80 persons per living-room, as compared with 0.98 for the pre-war Reich. It is reckoned, on a conservative basis, that about 4 to 5 million dwellings are needed to cope with the present situation and the increasing number of married couples each year. At present the rate of building is about 250,000 per year; E.C.A. authorities consider that it should be stepped up to 350,000.

The problem arises from two circumstances, first, the terrific aerial bombardments during the war, that devastated whole cities; and, second, the fact that the ten million refugees who flocked in immediately after the end of the war could not be housed in the cities, but had to be accommodated for the most part in the small towns and the villages of the countryside. The latter aspect has already been touched upon. Let us now consider the bigger cities.

The policy of "city-gutting", or, in more palatable terms, "area

¹ For these data see Edding, *Das Deutsche Flüchtlingsproblem*, 1949.

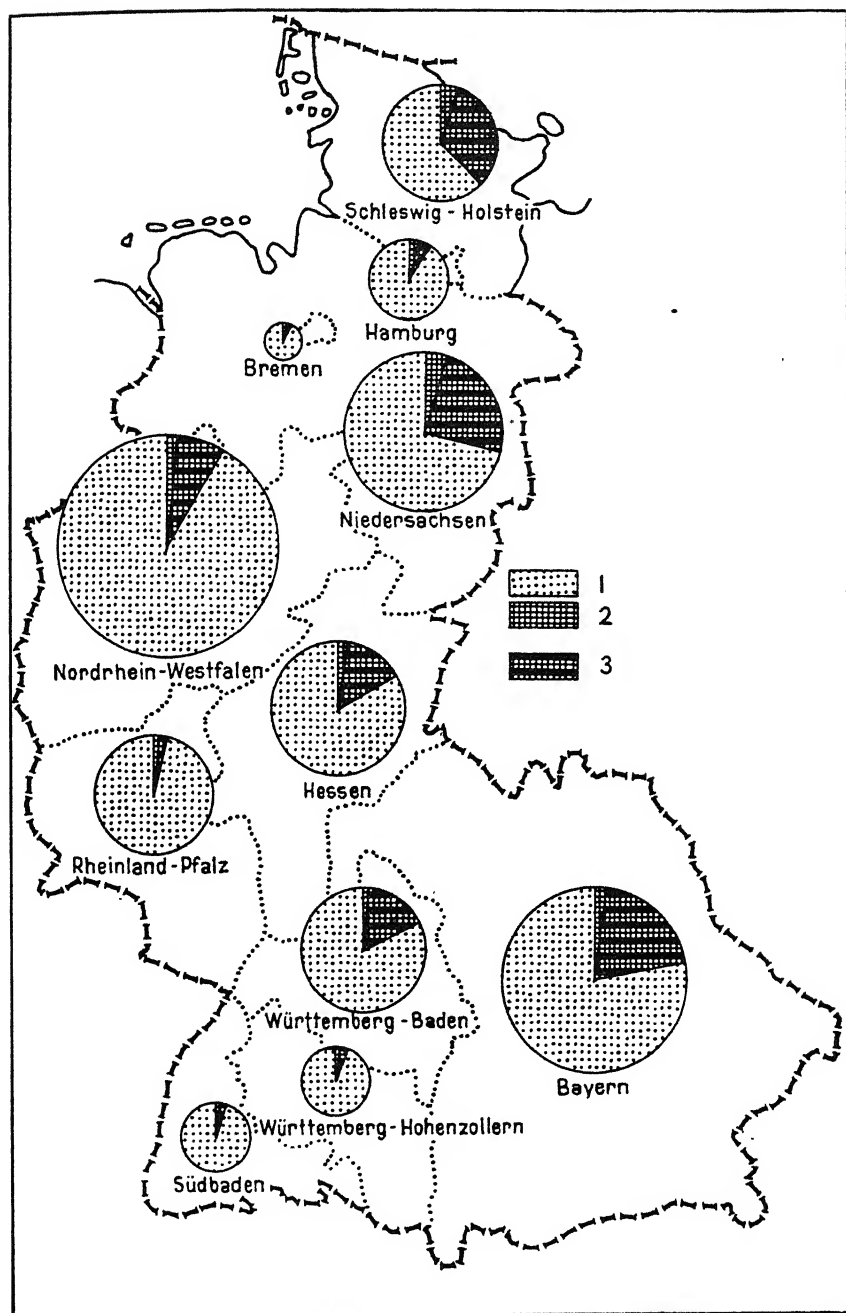


FIG. 61—WEST GERMANY: NATIVE AND REFUGEE POPULATIONS IN 1946 (scale, 1 : 5 m.)

- 1. Native
- 2. Refugees from Russian Zone and Berlin
- 3. Refugees from east of the Oder-Neisse line

bombing", was responsible for most of the destruction of German towns. This plan was patterned on that initially worked out, on a smaller scale, by the Germans. The aim of this bombing is described by Air-Marshall Harris as follows:

"... it must be emphasized that in no instance, except in Essen, were we aiming specifically at any one factory during the Battle of the Ruhr; the destruction of the factories could be regarded as a bonus. The aiming points were usually right in the centre of the town; the average German city spreads outwards from the old centre, which was naturally more densely built-up than the newer and well-planned suburbs; it was this densely built-up centre which was most susceptible to area attack with incendiary bombs. The objective of the campaign was to reduce the production in the industries of the Ruhr at least as much by the indirect effect of damage to services, housing, and amenities, as by direct damage to the factories or railways themselves."¹

Let us continue the Air Marshal's record. Seventy German towns were attacked—that is, almost all the towns with over 100,000 inhabitants, as well as a number of smaller ones. Twenty-three of the cities which were attacked had more than sixty per cent of their built areas destroyed. Forty-six had about half of their built areas destroyed. Thirty-one had more than 500 acres destroyed. Hamburg and Berlin each had over 6,000 acres destroyed, and Düsseldorf and Cologne 2,000 acres each. Over 700 acres were demolished in the first raids on Lübeck and Rostock. Between 1,000 and 2,000 acres were devastated in each of Dresden, Duisburg, Essen, Frankfurt, Hanover, Munich, Nuremberg, Mannheim, and Stuttgart. These figures may be compared with the destruction of 100 acres in Coventry, 600 in London and 400 acres in Plymouth. Sixty per cent of the houses in Hamburg and 50 per cent of those of Düsseldorf were destroyed. In other words, much of what we may write in the following pages about the cities is past history. Yet there is no shadow of a doubt that these cities will quickly rise again to their original proportions; in many cases this has already taken place in spite of the lack of adequate living quarters. What remains to be seen is whether the permanent rebuilding of the future will profit by the opportunity afforded by such wholesale devastation, and seek to build new cities on sound principles of city planning.

INTER-REGIONAL TRADE

Germany is now divided into four sections—the West and East Republics, Berlin, and the Separated Areas. The economic character

¹ Quoted from Marshal of the R.A.F. Sir Arthur Harris, *Bomber Offensive*, Collins, London, 1947.

of those areas is summarized on p. 370. Let us turn to the pre-war and post-war patterns of trade between them and with the outside world.¹

Pre-war Trade. The overall pattern of trade between these areas in 1936 when examined in terms of trade with each other and with foreign countries, reveals two salient facts. (i) Trade with the rest of Germany was a far more important element in the economic life of each area than its trade with all foreign countries. This was least marked in the case of the Western Zones, 43 per cent of whose trade went abroad and 57 with the rest of Germany. This area alone was responsible for two-thirds of the foreign trade of Germany. The inter-zonal trade of the other areas was five times that of their foreign trade. (ii) The trade between the Western Zones and the Soviet Zone was the greatest, each accounting for two-thirds of the other's total inter-regional trade. These two areas had each about an equal amount of trade with Berlin and the Separated Areas. The Soviet Zone was unusually dependent on trade with other areas of Germany (80 per cent). This was true also of the Separated Areas although their total trade was much smaller. So much for the overall picture.

In examining trade in foodstuffs in 1936, we must recall that Germany was self-sufficing in bread grains, coarse grains, potatoes, sugar beet, meat and eggs, but imported about 15 per cent of her consumption of butter and cheese. The Separated Areas exported a balance of 31 per cent of their wheat and rye, 12 per cent of their barley and oats, 6 per cent of their potatoes, 40 per cent of their meat, 37 per cent of their butter and cheese, and 35 per cent of their refined sugar. The Soviet Zone, with a marked concentration of crops rather than cattle, had a complicated movement of foodstuffs. It exported 24 per cent of its wheat and rye, 6 per cent of its barley and oats, and about 4 per cent of its potatoes, whereas it imported 13 per cent of its meat and 40 per cent of its butter and cheese. In other words, the two eastern areas exported crops to Berlin and the West, and the Separated Areas sent livestock products to the rest of Germany. The Western Zones imported bread grains and sugar (23 per cent and 28 per cent of their apparent consumption), whereas net imports of meat, butter, cheese, and potatoes were only 5 per cent of consumption. One-half of their imports of food and feeding stuffs came from the other three German areas and one-half from abroad.

Bearing in mind the distribution of industry in the different Zones, with which we should now be familiar (see Ch. 10), we may draw certain conclusions from their trade in industrial products in 1936. As for solid fuels, the West had 80 per cent of the coal output and the Soviet Zone

¹ "Pre-war regional interdependence and post-war interzonal trade in Germany", in *Economic Bulletin for Europe*, Third Quarter, 1949, Research and Planning Division Economic commission for Europe, United Nations. Geneva, January, 1950.

63 per cent of the brown coal. There was an eastward movement of 14.6 million tons of coal and coke from the Western Zones and this supplied three-quarters of the deficiency of the Soviet Zone and all of Berlin's needs. About 60 per cent of the fuel in the Soviet Zone was derived from lignite, so that the relatively small supply of imported coal and coke was essential for the industrial purposes in which it was almost exclusively used.

The iron and steel picture was dominated by the Ruhr. The Western Zones produced almost all the pig (97 per cent), steel (91), and finished steel (88). But while the other zones depended on the West, the former made finished products and yielded a large surplus for export. It had a large import and export of machinery with the rest of Germany. The Western Zones exported over 17 per cent of their output to the rest of Germany, and drew 18 per cent from it. The Soviet Zone figures were 32 and 40, Berlin 40 and 33, and the Separated Areas 50 and 83 per cent. Here we see a very intimate regional interdependence, and particularly significant is the great dependence of the East on the West. The Western Zones were almost self-sufficing in the major fertilizers. The Soviet Zone was less well balanced in this respect, for it had large surpluses of potash and nitrogen, but over one-half of its basic slag was imported (from the Ruhr). The Separated Areas depended entirely on imports from the rest of Germany. As for textiles, the concentration of the woollen industry in the Soviet Zone (Saxony) and the cotton industry in the Western Zones resulted in a good deal of inter-regional trade. The greater part of the trade was in finished goods, but there was also much trade in yarns.

Thus, in conclusion, as regards the normal pattern of pre-war trade in Germany we may say that the Western Zones were relatively independent of the other areas. They had and have great coal production and industrial production, although they drew potash, brown coal and some agricultural products from the rest of Germany. But the other areas were far more dependent on the Western Zones for their surpluses of coal, iron and steel, heavy machinery, and some chemicals. The other areas were also more dependent on inter-regional trade for light industrial products than were the Western Zone on them. Both the Soviet Zone and Berlin were very dependent on the rest of Germany, for both supplies and markets, for their predominantly light industrial products.

Post-war Trade. How is the pre-war picture of inter-regional trade changed since the war? Since the occupation the movement of goods of all kinds has been hampered by controls, special authorizations and trade agreements and, since June, 1948, by different currencies, between the Western Zones and the Eastern Zone. Moreover, the population in Potsdam Germany has increased by nearly 20 per cent between 1936 and 1948. The density is now the same as that of the United Kingdom, so

that there is a big increase in food requirements in relation to agricultural resources. The material resources of the country, however, remain unchanged. In spite of bomb damage and dismantling, the potential industrial capacity is not far below the level of 1936. Agricultural production has recuperated quickly in the last five years, but it is likely, that even when the normal production is attained, the new Potsdam Germany would only be able to supply about 65 per cent of its needs, as compared with 85 per cent before the war, reckoning on the basis of the pre-war rate of food consumption. All these changes will have deeper effects on the Western Zones than on the Eastern, and will be particularly difficult in northwestern Germany (the British Zone). The degree of self-sufficiency of the Western Zones in food is probably about 60 per cent, as compared with about 80 per cent in the Soviet Zone.

The Separated Areas have had a complete reorientation of their trade, since their trade with Germany since the war has been negligible. This means that Potsdam Germany as a whole is much shorter of both food and Silesian coal than before World War II.

Trade between the Western Zones and the Soviet Zone has been erratic and irregular and is difficult to measure. The following conclusions are based on the figures for the first half of 1948. The inter-regional trade is down to one-fifteenth of its 1936 *volume* or one-tenth in terms of *prices*. This disappeared in mid-1948 and has only been resumed since the end of the Berlin blockade. Exports to foreign countries were also small, about one-fifth in each case, and imports were at 60 per cent of the pre-war level in the Western Zones and only 22 per cent in the Soviet Zone. The level of production of both agricultural and industrial goods at that time was 53 per cent in the Western Zones and 62 per cent in the Soviet Zone. But there have been big changes since mid-1948, especially in the Western Zones, where in 1950 exports were over one-half of the 1936 level. Trade in foodstuffs was negligible in 1948. The Berlin Agreement in 1948 and the Frankfurt Agreement October, 1949 to June, 1950 envisaged a big increase in food deliveries between east and west. Western Germany is short of bread grains and sugar and needs them badly from the Soviet Zone; large quantities have been imported from overseas. Coarse grains and potatoes are needed, especially to build up the livestock shortage. But the Soviet Zone is not in great need of western products except for pedigree cattle from Schleswig-Holstein, tobacco, and wines. But even the Frankfurt Agreement provided less than one-tenth of the agricultural products that moved west from the Soviet Zone in 1936, and the deliveries in the opposite direction have been still smaller.

Trade in minerals and engineering products has wellnigh disappeared and there is a real danger that with the revival of Western Germany

there will be surpluses unless the eastern areas can be persuaded to take them. In other words, Germany will have to greatly expand her exports. (This is already evident in the 1950 trends.) The shortage of machinery has serious consequences for both the Western and the Soviet Zones.

Adaptations to the disruption of the pre-war threads of trade have taken three forms—reduction in the supplies of food and industrial goods available to both sides; the expansion of local production to offset the deficiencies of goods previously imported; and, in part, by the import of the goods from other countries that were formerly obtained from other parts of Germany. The Western Zones seem to be in an unexpectedly stronger position than the Soviet Zone for recuperation and viability. For before the war inter-regional trade played a lesser part in its economy than in the other areas. Moreover, it has been developing industries to replace the goods that it cannot now obtain from the other areas in the east. On the other hand, inter-regional trade in industrial goods played a large part in the economy of the Soviet Zone and were far more essential to the maintenance of that economy. The Soviet Zone drew coal, steel, and other heavy industrial products, from the Western Zones that it cannot replace, and this makes general industrial recuperation more difficult.

In agriculture, the Soviet Zone had a considerable export trade with the other areas, and is able to meet its requirements even with an increased population. The Western Zones, however, were net importers of most foodstuffs and will have much more difficulty in meeting their minimum requirements. This problem is made more difficult owing to the loss of the surpluses of the Separated Areas, and due to the increase of 8 million mouths in the Western Zones. The situation has been temporarily solved by a big increase of foreign (United States) imports into the West. This, however, is one-sided and the West, even with its imports cut, must greatly expand its exports in order to pay for its imports. The Soviet Zone will have less difficulty in adjusting its foreign trade, since it is not so dependent on foreign imports of foods, and its industry (with the exception of steel) is largely complementary to that of East European countries, with which it is now more closely associated.

COAL AND STEEL PRODUCTION IN THEIR INTERNATIONAL SETTING—SCHUMAN PLAN

West Germany is the major producer of coal, coke, pig iron, and steel, in continental Europe. A major European problem, then, is how to prevent the use of this productive potential for purpose of rearmament; but how to increase it for the general purpose of peaceful progress

among the countries of western Europe. The international cartel organizations sought to regulate production in the 'thirties. Present attention is focused on the so-called Schuman Plan, a plan that was initiated in France by the financial wizard M. Jean Monnet, and sponsored by one of its recent Prime Ministers, M. R. Schuman. This plan seeks to regulate production under the aegis of a supra-national authority. France, western Germany, the Benelux countries and Italy are participating in the elaboration of the Plan, but Britain, maybe only for the time being, holds aloof. The details of the plan have now been worked out and it remains for the governments to accept it. The purpose of this new community will be "to contribute, in harmony with the general economy of the member states, to economic expansion, to the development of employment, and to the improvement of the standard of living, through the establishment of a 'single market'". Import and export duties are to be abolished on the movements of coal and steel, as are subsidies, discriminatory measures in price, delivery terms, transportation charges, and restrictive practices. Executive power is to lie with a High Authority of nine members. This body is to be subjected to checks by a Council of Ministers and an Assembly, modelled on the Council of Europe. The Council will have one representative from each government, while the Assembly will be composed of delegates from the Parliaments of the member States. A judicial body will adjudicate complaints brought against the High Authority. This constitution, it has been remarked, bears a striking resemblance to that of Bismarck's Reich of 1871 which was set up a few years earlier with the limited functions of a "customs parliament" to administer the German Customs Union. The transition to political federation was thus easily taken. And such indeed was the purpose of M. Schuman's original proposal—that by "pooling basic production, and by creating a new high authority whose decisions will be binding" on the member countries, a first substantial step would be taken to a political federation of western Europe.¹ Our immediate objective, in outlining this plan, is to indicate that this international authority would automatically take the place of the restrictive powers of the western Allied governments on the production of coal and steel in Germany. These industries would be geared to the needs and subject to the common consent of the governments that participate in the new organization.

The immediate question before us is—what are the basic facts of production and trade in coal and steel, pre-war and post-war, that form the background to this plan? Refer to the section on pp. 296-302.

The Pre-war Pattern. Germany and Britain supplied two-thirds of the coal consumed in Europe west of the Soviet Union, or three-quarters

¹ See "The European Coal and Steel Community", *World Affairs*, May 1951.

with Poland. The exports of Germany and the United Kingdom accounted for 40 per cent of the coal used in western Europe, and large amounts were also exported overseas. France was the country most dependent on imports of coal, the world's largest importer, and 30 per cent of the total imports of all the European countries. This dependence was most marked in the iron and steel industry. France exported in exchange large quantities of iron ore. There was, thus, a great triangle of exchange, formed by the Ruhr, northern France, and the minette iron ore field of French Lorraine. In this triangle there are two opposed types of iron and steel industry—one based on local production of iron and imported coal and coke, such as Lorraine; the other, based on the local production of coal, and imported iron ore, such as the Ruhr, Belgium, northern France, the Netherlands, and the Saar.

The furnaces of Lorraine in France depended on imported coke. About 30 per cent of its consumption was imported in 1937. Most of this came from Germany, with smaller amounts from the Netherlands and Belgium. Luxembourg was even more dependent on Ruhr coke. On the other hand, the dependence of the Ruhr on Lorraine ore was smaller and decreased between the wars. Even in 1913 only 4.8 million tons, or 30 per cent of the iron ore consumption of the Ruhr, came from Lorraine; the remainder came from Sweden and Spain. Between the wars, the imports from Lorraine were much less, but the imports from the other areas, and domestic production, increased. Belgium and the Saar, however, continued to depend on Lorraine-Luxembourg. The coals exported from the U.K. were steam-raising coals; the U.K. exported very little coke. The U.K., in other words, had very little connection with this industrial tie-up. On the other hand, the U.K. did export considerable quantities of pig iron for steel-making in 1913 (1.1 million tons) but this almost disappeared between the wars. The U.K., however, has long imported large quantities of semi-finished iron and steel products for re-rolling in British mills. This was 2 million tons in 1913 and 2.7 million in 1929, but it fell to about 1 million tons in the 'thirties, because of duties and quotas. Before World War I there was a big trade in pig iron, especially from Lorraine and Luxembourg, to the Ruhr (1.6 million tons in 1913). But between the wars this trade was negligible. Trade in crude and finished steel also followed this same trend as countries increased the volume of their own production.

Post-war trends. In 1949 coal production still fell short of the 1937 level by 57 million tons. This decrease was most remarkable in the U.K. and Germany, so that their great volume of exports was practically eliminated. Exports of the two in 1937 were 89 million tons and in 1949 only 28 million tons. France has filled the vacuum by importing more coal from elsewhere and by increasing its own production. The

decline in the production of coke has been almost entirely in Germany, although this was balanced by the decrease in its own requirements and the drop of exports to eastern Germany. Thus, German exports of coke to west European countries actually increased, especially to France. Trade in iron ore shows two changes. There has been a 20 per cent decline in production in Lorraine-Luxembourg, and there has been a big decrease in the German imports. There has been a reduced production of steel in Germany, and a decrease in imports, and it has depended to a larger degree on its own production than before the war. In 1937 these domestic ores provided one-fifth of the total consumption, but in 1949 this proportion had risen to one-half. There was, in other words, a big fall in apparent iron ore consumption. Yet crude steel production in the whole area was less proportionately reduced, and this was due to a great increase in consumption of iron and steel scrap. In 1949 western Europe consumed 5 million tons more scrap than before the war. These general changes have tended to reduce the interchange of raw materials between the iron and steel producing centres of Europe, but there has been little change in the pattern of exchange of finished goods. Trade in pig iron and crude steel is still negligible, and trade in finished products is at the same level as in 1937.

The question that the Schuman Plan will try to solve is to effect a more economical functioning of these various centres of production in western Europe.¹

The benefits of a unified market for west European coal and steel production would be achieved both through greater specialization at the finishing stages of steel production, and in a freer and more active trade in the basic materials—coal, coke and iron ore. The expansion of production of these products in low-cost areas would serve to reduce steel and coal costs, and to release man-power and capital that could be used elsewhere. The most significant economies could be made in replacing coal production in the high-cost areas of Belgium and France by more coal from the Ruhr and in greater production and use of French iron ore in place of the high-cost production of domestic ores in western Germany. Any such changes, however, demand changes in production and trade policies. And this is the overall objective of the Schuman Plan.

THE PLACE OF GERMANY IN EUROPE

The place of Germany in Europe should be evaluated here in the light of the location of the German realm in Europe and the changing

¹ The detailed aspects of this whole problem may be studied in the report on *European Steel Trends in the Setting of the World Market*, Steel Division Economic Commission for Europe, 1949, and in a long article on "The Coal and Steel Industries of Western Europe", in *Economic Bulletin for Europe*, a U.N. Publication, Second Quarter, 1950.

geographical pattern of its relationships with its neighbours. One of the primary concerns of any State is to establish unity within diversity. This is a constant preoccupation of every State and it is also an international problem since groups of States, through common interests and attitudes, tend to work together, in spite of their differences. This thought is particularly appropriate to the problem of Germany and its place in Europe.

Europe is divided through history between east and west and the division, that is both cultural, ethnic, and strategic, is crystallized today in what is popularly described as the Iron Curtain. This line runs through the middle of pre-war Germany and divides the West and the East German Republics, sponsored respectively by the Western Powers and the Soviet Union. This line corresponds essentially to the divide Mackinder envisaged between the lands that could be controlled by sea power in the west and by land power in the east. In the line-up of Democracy against Communism, Germany, situated in the heart of Europe, is divided, and a part of it lies in each camp. Furthermore, in the alignment of the western powers in the organization for European Economic Co-operation and the Atlantic Treaty Organization, West Germany is involved with the west, East Germany with Soviet Russia. The west Germans, however, are perplexed by the question—where will the Western Allies take their stand in the defence of western Europe—on the Elbe or on the Rhine? Or on the Channel and at the Pyrenees? How are the land, resources (and the people) of west Germany to be protected? Nobody at present seems to know the answer to this question, although it will become clearer as the Allies become militarily stronger. The question of German rearmament is of gravest consequence for the western Allies as well as for the German people.

The seventy-odd million Germans lie embedded in the heart of Europe and their land may become the scene of conflict once again. The intermediate location of Germany between west and east is certainly evident in the conflict of propaganda of western Democracy and the Soviet Communism. What role are the two new German republics to play in this new Europe, that may stabilize in its present pattern—although a few years ago it was held universally that the failure to formulate a united Germany, as envisaged at the Potsdam Agreement, would spell catastrophe—or may crumble again through a future conflict, the shape of which it is impossible to foresee?

The permanent unchanging facts are that the German lands, however defined, occupy the heart of Europe and have the longest land frontiers of any other single state, and lack any natural defences along those frontiers; that the Germans, with their strength and weakness of national character, make up the greatest single block of people in Europe, except

the Russians; and that western Germany contains the greatest single seat of industrial production in Europe, the Ruhr. (Although, it should be noted, upper Silesia, serving central Europe, and the Donetz basin, serving eastern Soviet Europe, are rapidly becoming close rivals in production, and serve distant major market areas in central and eastern Europe). Finally, the Germans, divided between east and west, must reorient their economies, cater for much larger numbers of people, live economically, and, like Britain, "export or starve". The economic production of Western Germany must be revived and increased and make its contribution to world trade, and especially to the trade of Europe. Here, however, the loss of the central European markets, in which German trade found one of its main outlets in the last fifty years, must be compensated by expansion elsewhere. The expansion of this trade is essential not only to feed the Germans with what the dieticians inform us these days are the minimum essentials for normal health, but also to contribute to the minimum essentials, and better living conditions, of the peoples of continental Europe. Germany's industrial products are also needed now for rearmament and this is always unfortunately the speediest stimulus to production.

Postscript. In May 1952 the Western zones of occupation became an independent sovereign State with the title of "Federal Republic of Germany". It has a population (excluding Berlin) of about 45 millions, as compared with 17 millions in the Eastern, Soviet dominated, republic. The period of Allied "occupation" is ended. The economic revival of Western Germany continues, and industrial production and foreign trade in 1951 and in early 1952 were greater than in 1950 and considerably exceed the levies in 1936. The new State now enters into full and equal partnership with the community of west European States. But each step taken by the West in favour of Western Germany is followed by similar Soviet action in Eastern Germany. The German realm is more and more tragically divided. The situation is thus fundamentally unstable, since pre-war Germany is divided in itself between West and East, as well as between the conflicting ideologies and strategies of Western Democracy and Soviet Communism.

APPENDIX

POPULATION OF POTSDAM GERMANY, 1939-46

<i>Länder and Zones</i>	<i>Area (sq. km.)</i>	<i>Population (thousands)</i>		<i>Density per sq. km.</i>		<i>Refugees</i>	
		1939	1946	1939	1946	Number	% Total Pop.
Schleswig-Holstein	15,658	1,589	2,650	101.5	169.2	837.0	31.6
Niedersachsen ..	42,218	4,540	6,431	96.1	136.2	1,475.5	22.9
Nordrh. Westfalen..	34,076	11,945	11,797	350.5	346.2	710.9	6.0
Hamburg	747	1,712	1,424	2,291.8	1,906.3	57.9	4.1
British Zone Total..	97,698	19,786	20,303	202.5	228.3	3,081.8	13.8
Bayern	70,238	7,038	9,029	100.2	128.6	1,657.7	18.4
Hessen	21,117	3,479	4,064	164.8	192.5	552.5	13.6
Württ.-Baden ..	15,700	3,217	3,675	204.9	234.1	549.2	14.9
Bremen	404					25.3	5.2
American Zone ..	107,459	14,297	17,256	133.1	160.6	2,784.8	16.1
Rheinland-Pfalz. ..	19,856	2,962	2,761	149.2	139.1	35.0	1.2
Südbaden	9,852	1,230	1,198	124.9	121.6	24.3	2.0
Württ.-Hohenzollern	10,406	1,076	1,119	103.4	107.5	35.8	3.2
Saarland	2,599	893	880	343.6	338.6	—	—
French Zone ..	40,114	5,268	5,078	131.3	126.6	95.1	1.9
Trizone	245,271	39,351	44,637	160.4	182.0	5,961.8	13.4
Brandenburg ..	27,061	2,414	2,527	89.2	93.4	541.2	21.4
Mecklenburg ..	22,954	1,405	2,140	61.2	93.2	910.1	42.5
Sachsen Anhalt ..	24,657	3,442	4,161	139.6	168.8	905.5	21.8
Thüringen	15,598	2,431	2,927	155.9	187.7	564.9	19.3
Sachsen	16,910	5,465	5,559	323.2	328.7	679.9	12.2
Russian Zone ..	107,181	15,157	17,314	141.4	161.5	3,601.7	20.8
Berlin	884	4,339	3,200	4,908.4	3,619.9	119.7	3.7
Four Zones and Berlin	355,934	59,740	66,030	167.8	185.5	9,683.2	14.9

From *Das Deutsche Flüchtlingsproblem*, by F. Edding, H.-E. Hornschu, and H. Wander, *Institut für Weltwirtschaft an der Univ. Kiel*, 1949.

OCCUPATIONS OF POTSDAM GERMANY

States and Zones	Total Population		Agric. and Forestry		Industry and Handicrafts		Trade and Transport		Public and Private Service		Domestic Service		Independent and Unemployed	
	1939	1946	1939	1946	1939	1946	1939	1946	1939	1946	1939	1946	1939	1946
Schleswig-Holstein ..	1,538.9	2,575	20.9	17.2	32.0	24.7	16.1	12.0	15.5	10.7	2.4	2.4	13.1	33.0
Lower Saxony ..	4,436	6,250	26.0	21.5	34.0	28.4	15.2	12.5	11.3	10.2	2.0	2.0	11.5	25.4
Northrhine-Westphalia ..	11,831	11,705	8.7	8.9	52.1	42.4	15.3	13.5	8.3	8.9	2.5	2.0	13.1	24.3
Hamburg ..	1,698	1,400	1.8	2.4	35.9	32.6	33.8	26.8	11.7	15.8	2.5	1.4	14.3	21.0
British Zone ..	19,505	21,936	13.0	13.1	45.0	35.7	17.0	13.9	9.8	9.9	2.4	2.0	12.8	25.4
Bavaria ..	6,899	8,790	28.1	25.8	34.7	31.5	13.7	12.2	9.5	10.7	1.8	1.6	12.2	18.4
Hessen ..	3,403	3,996	18.1	18.7	40.8	33.3	15.5	12.9	10.1	12.0	1.9	1.5	13.6	21.6
Württemberg-Baden ..	3,159	3,607	18.5	20.6	32.8	36.5	15.1	12.3	9.6	10.9	2.1	1.4	10.9	18.3
Bremen ..	556	488	3.1	2.7	41.2	32.6	30.3	23.2	10.8	18.2	2.6	1.4	12.0	21.9
American Zone ..	14,078	16,881	22.6	22.4	38.5	32.9	15.1	12.7	9.7	11.2	1.9	1.5	12.2	19.3
French Zone ..	5,179	5,045	27.1	30.9	39.3	31.2	12.5	7.6	8.8	8.5	1.8	1.6	10.5	20.2
Russian Zone ..	14,872	17,180	15.6	20.3	44.8	35.6	14.9	12.3	9.6	9.3	1.9	1.6	13.2	20.9
Berlin ..	4,321	3,187	0.7	1.5	41.1	38.3	24.7	19.8	15.5	16.9	2.5	2.6	15.5	20.9
Four Zones and Berlin	57,895	64,230	16.3	18.3	42.5	34.7	16.2	13.0	10.1	10.3	2.1	2.7	12.8	22.0

West German Federal Republic
from *Country Data Book, E.C.A.*, March 1950

Selected Indexes of Agricultural Production (pre-war—100)

	1947-8	1950-1 (Est.)
<i>Crops</i>		
Bread Grains	67	92
Coarse Grains . . .	61	77
	<hr/>	<hr/>
Total Grains	64	85
	<hr/>	<hr/>
Potatoes	80	114
Dry Legumes	196	192
Flax Fibre	25	96
Tobacco	35	96
<i>Livestock</i>		
Livestock slaughtered ..	51	73
Milk (feed, butter, cheese, and other dairy products)	68	88
Eggs	55	91
Wool	50	90
	<hr/>	<hr/>
Gross Output	68	87 (1949-50)
Livestock	56	73

Food consumption derived from net imports

Imports as % of Total Consumption

Commodity	Pre-war	1950-1 (Est.)
All Foods	34	44
Bread Grains	34	47
Sugar	53	53
Potatoes	13	—
Fats inc., butter ..	50	41
Meat	14	3
Eggs	23	7
Milk	4	7
Cheese	29	8
Vegetables	20	11
Fruits and Nuts ..	24	37

West German Federal Republic: Land Utilization.

000s of <i>ectares</i>	1935-8	1950-1	<i>Per Cent</i>
Land used for Grain	5,152	4,315	17.5
Total Arable Land	8,609	8,171	33.2
Permanent Grassland	5,533	5,375	21.8
Other Land ..	470	664	2.7
Total Agricultural	14,612	14,210	57.7
Forest	6,934	6,974	28.3
Other Land ..	3,054	3,479	14.5
Total Land Area	24,600	24,006	100.0

Index Number of Production from Monthly Bulletin of Statistics, U.N., March 1951

<i>Industrial</i> (1936 as 100)		<i>Agricultural</i> <i>Gross Output</i>		<i>Foreign Trade</i> (<i>Index No. of Quantum</i>)	
				<i>Imp.</i>	<i>Exp.</i>
1946	34	1947-8	68	1937	117
1947	40	1947-8	79	1948	67
1948	60	1949-50	86 (<i>Est.</i>)	1949	102
1949	89			1950	128
1950	113	<i>Food Consumed per Capita</i>		1950	95
1951	120	Pre-war 3,975 calcs. per day		Dec. }	135
		1947-8	2,340		
		1948-9	2,605		
		1949-50	2,695		
		1950-1	2,735 (<i>Est.</i>)		

NOTE: *Base is 1936
and 1948-9 is for Bixonia*

*Industrial Production of West German Federal Republic from Monthly Bulletin of Statistics, U.N., March 1951**Industrial Production (Base 1936)*

	<i>General</i>	<i>Mining</i>	<i>Manufacturing</i>
1949	89	97	86
1950	113	107	112

Fuel and Power (Monthly production) in oos of metric tons.

	<i>Coal</i>	<i>Lignite</i>	<i>Electricity</i>	<i>Pig Iron</i>	<i>Steel Ingots</i>
1937	9,747	5,479		1,265	1,492
1943	11,439	6,694		174	213
1945	2,957	2,021		789	1,010
1946	4,495	2,499		891	1,125
1947	5,927	4,894	1948 2,576 ¹		
1948	7,253	5,405	1949 2,975 ¹		
1949	8,603	6,022	1951 4,280		
1950	9,230	6,320			
1951	9,900				

Metal Smelter Production (oos tons)

	<i>Copper</i>	<i>Lead</i>	<i>Zinc</i>
1936	10.1	8.3	8.0
1950	11.1	10.0	10.2

Building Construction

	<i>Cement</i> (oos tons)	<i>Building Bricks</i> (millions)
1937	626 ¹	1936 343 ¹
1947	225 ¹	1948 164 ¹
1948	465	1948 164
1950	906	1950 353

Textiles (oos metres)

	<i>Cotton Yarns</i>	<i>Wool Yarns</i>	<i>Rayon</i>
1937	19.5 ¹	3.46 ¹	1.8 ¹
1947	6.58	2.32	1.3 ¹
1950	23.5	7.06	9.4

Foreign Trade of West German Federal Republic from Country Data Book of E.C.A., March, 1950

<i>Total Imports 1949-50 (Est.)</i>			
Food and Agricultural	.. ..	1,271.8 m dollars	
Industrial	.. ..	653	
Total .. ..	.. ..	1,924	
<i>Total Imports 1950-1 (Est.)</i>			
Food and Agricultural products	.. ..	1,313 m dollars	
Industrial products .. ..	.. ..	709	
Total Imports	.. ..	2,022	

¹ Bizonia

Percentage Distribution of Foreign Trade 1948-9 (1937)

Imports—\$1,900 m (1,429):	United States	..	..	..	4.4	(5.2)
	Other Western Hemisphere	..	..	..	7.6	(9.8)
	Canada	..	..	..	1.2	(0.9)
	Switzerland	..	..	..	35.5	(1.7)
	Eastern Europe	..	..	..	11.6	(10.9)
Exports—\$975 m (1,664):	E.C.A. countries	..	..	..		(33.5)
	United States	..	..	..	4.7	(3.5)
	Canada	..	..	..	0.4	(0.6)
	Other Western Hemisphere	..	..	..	1.7	(7.9)
	Switzerland	..	..	..	85.8	(3.9)
	E.C.A. countries	..	..	..		(50.0)

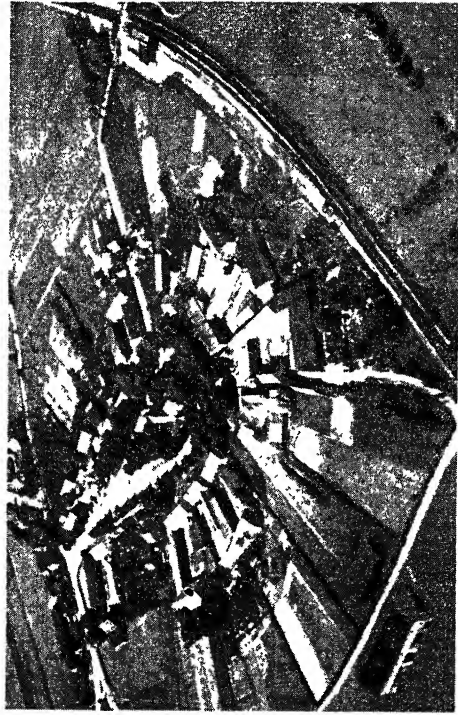
Value of Industrial Production 1936 by Zones of Occupation (expressed as a percentage of total value) from the Deutschland Jahrbuch, 1949

Value of Total Industrial Production

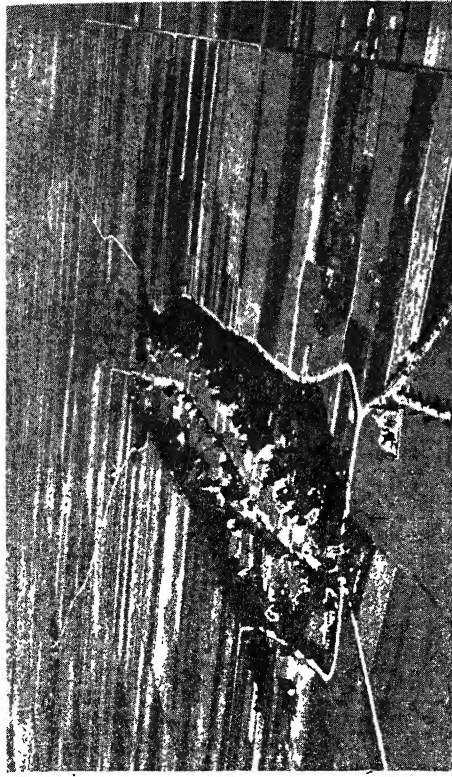
British Zone	..	..	34.4
U.S.A. Zone	..	..	18.0
French Zone	..	..	8.1
Soviet Zone	..	..	24.3
Berlin	..	..	8.7
Total			93.6
East of Oder-Niese			6.4
Total			100.0

Value of Chief Industrial Products by Zones (as above)

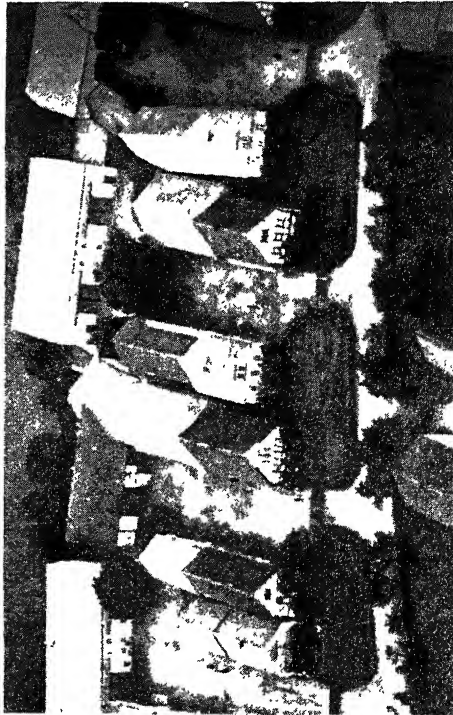
<i>British Zone</i>				<i>Soviet Zone</i>			
Iron and Steel	..	..	74	Ceramics and Glass	..	..	37
Mining	..	..	58	Paper	..	..	33
Power Sources	..	..	58	Textiles	..	..	36
Iron and Steel Products	..	..	58	Power Sources	..	..	31
Rubber and Asbestos	..	..	51	Water, gas, electricity	..	..	30
Oils and fats	..	..	72	Precision Instruments	..	..	31
				Metal Wares	..	..	34
<i>U.S.A. Zone</i>				<i>French Zone</i>			
Leather	..	..	34	Leather	..	..	19
Vehicles	..	..	39	Precision Instruments	..	..	17
Metal Wares	..	..	28	Iron and Steel	..	..	15
				Timber	..	..	14
<i>Berlin</i>				<i>Separated Areas</i>			
Electro-technical Industries	..	..	48	<i>East of the Oder-Niese</i>			
Clothing	..	..	35	Mining	..	..	10
Printing	..	..	20	Timber	..	..	17
Precision Instruments	..	..	19	Paper	..	..	19
				Alcohol	..	..	24



Rundling Village in Brandenburg



2. Linear Village (*Strassendorf*) in Saxony



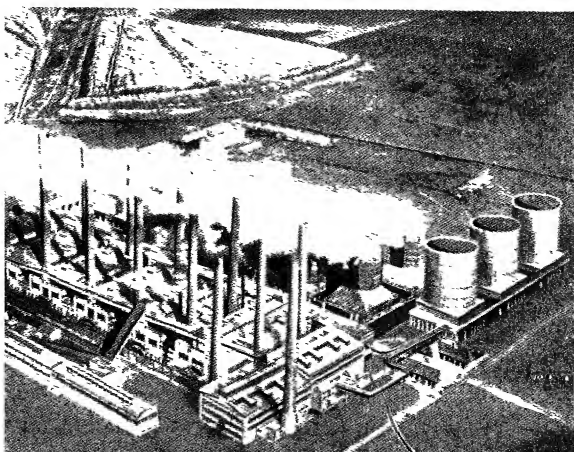
Middle German Farmstead: series of farms, each grouped on four sides of a central yard



4. Saxon Unit Farmstead: in the Lüneburg Heath



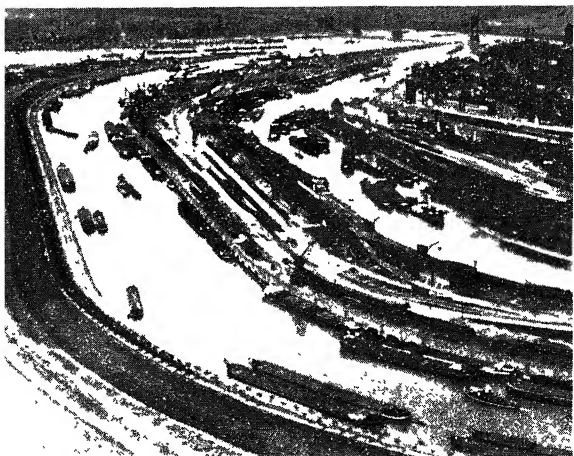
ne Ruhr



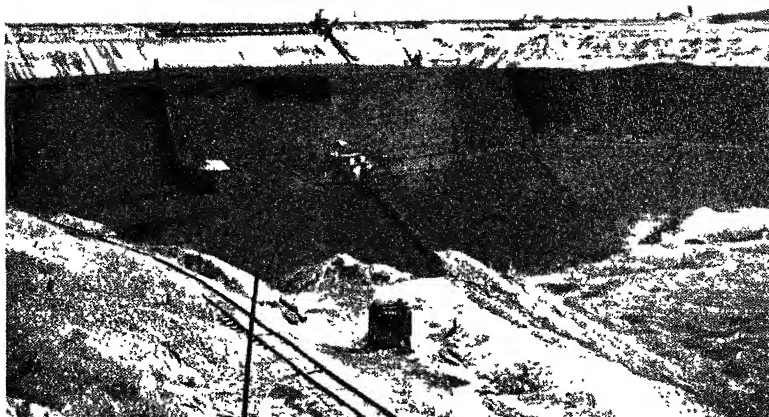
nt: Golpa-Zschornowitz, near Merseburg



um-Main: Rectangular lay-out, common in South West



Ruhrort: Europe's greatest river port



6. Brown Coal Quarry in the Ville, West of Cologne



8. Allotment area on city outskirts (*Laubengärten*): Köthen (Anhalt)



10. Amberg, Oberpfalz: Radial growth around a church-market place, with encircling boulevards



12. Leipzig: The old town and boulevards; late 19th century railway complex in background



Hegau: Hohentwiel (686 m.). Hilly landscape crossed by two ranges of volcanic hills



30. Swabian Alb: West of Geislingen, view to north-west



River Main: Meander, view south from Wertheim. River cut in sandstone, Hills in background



32. Bavarian Plateau: Meanders of the Iller south of Memmingen. Molasse hills in background

PART VI

LANDSCAPE AND REGION

*Die Geographie ist die Wissenschaft von der Erdoberfläche nach ihren örtlichen Unterschieden von den Erdteilen, Ländern, Landschaften und Örtlichkeiten*¹.—Hettner, 1905.

¹ Geography is the science of the earth's surface according to the areal differences of continent, land, region and locality.

CHAPTER 16

LANDSCAPE AND REGION

THERE ARE two sets of facts in man-land relationships in the German lands. The first are the facts of the cultural landscape, that is, the natural terrain as transformed by man in the creation of his habitat. The second are the activities of society—social, economic and political—in so far as they involve relationships with the landscape or habitat. Both of these sets of conditions are closely interrelated in their detailed areal variations. The facts of human occupancy, in so far as they find expression in the habitat, are derived from culture contacts as well as through the adaptation of particular activities to the general conditions of each epoch and to the physical conditions presented by varying environments. In this chapter we shall deal with the problem of the detailed analysis of the unit areas of landscape and society.

LANDSCAPE UNIT AREAS

The cultural landscape is the present man-made environment as viewed from the air and from a large-scale topographic map. It is the transformed natural terrain. The areal elements of landscape thus fall into four main groups—land-forms, cultivated land, natural vegetation cover, and settlement. The last group includes buildings, fields and their boundaries, roads and tracks. A landscape unit is thus a portion of the earth's surface in which there is a combination of areal elements peculiar to that particular unit area. It is a countryside clearly visible from the air and recognizable as to its character and limits on the ground.

The addition of the works of man to the surface of the earth makes any attempt to characterize the variations of the cultural landscape as a composite very difficult and in order to avoid confusion and obtain results on a consistent basis each of the main sets of component facts must be analysed and classified separately. Thus, the terrain, the settlement pattern, and agricultural practices may be studied separately. Or alternatively the landscape may be examined areally in terms of the functional structure of society. Reference will be made later to such studies. At this juncture, in order to avoid such complications, we shall consider the natural terrain conditions only. (See pp. 8, 9.)

Detailed analysis of any small area in Europe, such as can be covered in a day's walk, reveals that there is the closest adjustment of human occupancy to the natural terrain conditions. The pattern of human occupancy is most complicated in and around the urban areas where areal differentiations in terms of buildings or activities are primarily based on human factors, and not on natural conditions of site. In other words, there is a close adjustment of human *activity*, and consequently of the *works* of man on the land, to the detailed variations of the natural terrain. This is particularly true of agricultural occupancy which, of course, in western Europe, covers most of the land area. Forest and heath and bog remain only where the physical conditions are not suitable for cultivation, so that they alone give an infallible key to the terrain on which they occur.

The distinction between ploughed and meadow land, when known in detail, is similarly indicative of local changes of physical conditions. Thus, the natural vegetation or the mode of use is often the best indicator of the ecological complex on which it is based. We go further in saying that since the natural vegetation has often been destroyed and greatly modified, and since agricultural uses may change, the soil is the best existing indicator of a distinctive terrain area. Unfortunately, soils are not always known in such detail. In other words, while the *natural terrain* may be examined on the basis of physical criteria alone it may also be examined in terms of the mode of human adaptation to it i.e., from an ecological point of view. In the latter case, the natural terrain appears also as a distinctive *landscape*.

The smallest unit of terrain, that may be only a few square miles in extent, is defined in terms of height, degree of surface relief, soil, vegetation and hydrography. The smallest unit is the unit slope, such as a flat valley floor, a steep slope, a flat plateau surface, or an interfluvium. We describe such a unit as a "terrain facet". It has been defined by the plant ecologists as a "site" or an "ecotope". The Germans in their recent work use the term *Fliese*. A group of such varied facets forms the smallest composite geographic unit that Unstead called a "stow" and Sölch a "chore". Such unit areas are locally repetitive in certain associations so as to form compact interrelated groups. These areas of the second order were called "tracts" by Unstead and can be readily determined on a map on a scale of 1 : 100,000. They in their turn can be grouped into larger homogeneous areas, that can be determined on a map of 1 : 500,000. These units in turn will be associated with others of the same order but of different character to cover a whole continental area and these are ultimately associated with climatic-vegetation regions or realms of the world. This is a basic concept of geography and has received a great deal of attention in recent years, largely through the stimulus of military require-

ments, that demanded accurately mapped appreciations of terrains. Such study is still being actively pursued in Germany.¹

The study of unit areas of terrain, then, must begin with the determination of the smallest units on a topographic scale and from these build up to larger units in order of areal magnitude. It must begin with the large-scale map, the areal photograph and, wherever possible, work in the field. Moreover, the data of each of the terrain elements, prepared by the individual geographer in his area, or acquired from the work of an allied worker, such as a soil scientist or plant ecologist, must be mapped on a standard large scale. From correlations determined in this way one may determine those facets or sites in which similar combinations of terrain elements occur.

LANDSCAPE ELEMENTS IN WESTERN GERMANY

We have undertaken a detailed analysis on these lines of the unit landscape areas of western Germany on a scale of 1:100,000. The final classification of the landscape types is indicated in full below. They were reduced to a scale of 1:200,000 and these maps in turn were reduced to a scale of 1:1,250,000 for reproduction in this book. The first problem in this study was to decide upon the landscape elements that are to be considered as criteria and the categories into which each should be divided. The natural elements considered are relief, rock outcrop, soil and vegetation. The cultural elements considered are the cultivated land and the patterns of settlement. Towns are shown and the large urban areas that are sufficiently large to rank as distinct landscape types. The general maps of these elements and their categories are reproduced in this book on a greatly reduced scale (relief, Fig. 4, pp. 24, 25; rock and soil types, Fig. 11, pp. 70, 71; vegetation, Fig. 12, pp. 78, 79; surface cover, Fig. 31, pp. 204, 205). These maps must be referred to throughout the rest of this book. Their main features may be summarized as follows.

Relief (Fig. 4, pp. 24, 25) has been studied and interpreted mainly by geographers in terms of the genetic formulae of W. M. Davis. Our problem is to characterize and map relief in terms of the *degree* of relief, that is, of average slopes, length of slopes, and depths of dissection. Categories of slope must first be selected in detailed study. In a study of the relief of the Siegerland, Kraus² used the following categories of slope that were devised entirely from the standpoint of land use. It is generally applicable to western Germany and was used in our detailed surveys.

¹ See an independent study of morphological units on these lines by D. L. Linton, abstracted in *Transactions of the Institute of British Geographers*, 1948, pp. 86-7 and now printed at length in *London Essays in Geography*, 1951. He suggests the terms: site, stow, tract, section, province, major division, continent.

² Th. Kraus, "Das Siegerland", *Forschungen zur Deutschen Landes und Volkskunde*, XVIII, 1931.

(1) Flat or almost level land, with slopes under 1 in 25 or $2\frac{1}{2}$ degrees. Such land characterizes valley floors and it normally needs drainage and is liable to flood.

(2) Gently undulating land, with slopes of 1 in 10 to 1 in 25, or 6 to $2\frac{1}{2}$ degrees. Such slopes are suitable for arable cultivation with the plough, given suitable soil conditions.

(3) Closely undulating land, with slopes up to 1 in 5 or 12 degrees on which the soil is still capable of arable cultivation.

(4) Steeply undulating land, with slopes up to 1 in 2.5 or 25 degrees on which there is forest cover and cultivation needs terracing.

(5) Steep land, with slopes over 1 in 2.5 or 25 degrees. Such slopes are rocky or forested and are too steep to be cultivated.

Rock and Soil (Fig. 11, pp. 70, 71). The distribution, disposition and lithological character of the rocks is fundamental to the interpretation of land forms, and to the appraisal of their significance to man. Probably the most important indicator of the agricultural usefulness of the land to man is the character of the soil in terms of its physical texture. It is the best indicator of the direct relation of land use to the land form. It summarizes the underlying conditions of rock type and slope and drainage, and, at the same time, affords an indicator of possibilities of an area for human occupation, that is, the type of settlement distribution and the type of agricultural use. This has been demonstrated in many detailed studies, where the local soil type is a delicate indicator of the small terrain facet. So we turn to the classification and mapping of soils.

Our concern is with the physical texture of the soil, not with the mode of its formation. The principal soil categories are those indicated in Fig. 11. They are as follows: 1, clay; 2, loam; 3, loess; 4, sand and gravels; 5, bog (*Moór*); 6, thin clay, 7, loam, or 8, sand, on impervious rock; 9, thin clay, or 10, loam on volcanic rocks; 11, loams on limestone; 12, mixed sands and loams; 13, bare limestone rock; 14, rock scree (mainly limestone). (See pp. 67-72.)

Surface Cover (Fig. 12, p. 78). The vegetation includes the types of non-agricultural surface cover that are to be found on the present surface of the land. Its study and classification is a problem of plant ecology, and aims at the recognition of woodland—deciduous and coniferous and mixed (according to density, type and age)—heath, moor, scrub, dune formations etc.¹

Forest covers today over a quarter of the area of the Reich, and is very uneven in its distribution. It covers large areas in their entirety and is virtually absent in other great stretches of country. Elsewhere it is intermixed with different kinds of land use. It is thus a primary determinant of landscape over large areas. The map of natural vegetation shows types of natural vegetation as the *dominant vegetation types at the dawn of*

¹ These facts are shown on the standard topographic map and in the *Atlas des Deutschen Lebensraumes*.

the great era of forest clearance about A.D. 500 to 800. These are as follows: 1, beech forest; 2, pine forest; 3, spruce forest; 4, oak-beech-hornbeam woods; 5, oak-birch woods; 6, alder woods on wet peaty soils; 7, heath; 8, fen (*Flachmoor*); and 9, raised bog (*Hochmoor*).

Surface cover also includes the cultivated land. (Fig. 31, p. 204.) The land agriculturally used falls into arable, pasture, vineyards and orchards, and these uses occur in varying combinations with each other and with forest. The following main categories are recognized: 1, woodland, dominant over the total land area; 2, woodland 30 to 50 per cent intermixed with either arable or grassland; 3, arable land over 50 per cent of the total land area; 4, grassland over 50 per cent of the total land area; 5, grassland 30-50 per cent of the total land area mixed with arable and woodland in proportions of about 15-30 per cent; 6, heath and bog over a third of the total area mixed with arable and grass (15-30 per cent); 7, heath and bog a tenth to a third of the total area with arable and grass; 8, Alpine pastures, rock and ice; 9, orchards and market gardens; 10, vineyards.

Rural Settlement (Fig. 25). We are concerned here with settlements as elements of the landscape, that is, with buildings, fields and their boundaries, and the road net. Roads and tracks vary areally as to width and surface, and as to whether they are sunken or flush with the ground, hedged or unhedged, and in their direction in relation to the general character of the terrain. Field, farm and village should be separately mapped or incorporated, as far as is practicable, into an overall classification of the settlements in terms of origin, function, size, and structure.

Urban Settlement (Fig. 19). The compact urban settlements and the network of routes are not as thoroughly incorporated into this map series as we would desire. It should be pointed out, however, that the original maps of the series, on the scale of 1:200,000, were prepared as tracings and superposed on the standard maps of the *Topographische Übersichtskarte des Deutschen Reiches*, so that the relation of the landscapes to routes, towns and rural settlement could be determined. The larger towns were shown by the limits of the built-up area, but when reduced from 1:200,000 to 1:1,250,000 the areas of the small towns appear as small symbols. The major urban areas, however, have been carefully defined.

These unit urban areas form a distinct type of "landscape", the urban habitat, called in German *die Stadtlandschaft*, in French *le paysage urbain*. Individual houses, factories and other buildings of an urban character extend beyond these limits, but this raises problems demanding more detailed geographical appraisal of the urban area as a functioning entity. The geographic origin, growth, function, distribution and space relations of settlements that are "urban" will receive much light from a comparison of the distribution and location of these centres in relation to the

landscape areas. All these phenomena are closely interrelated in development and present function.

This method of characterization can be carried much further. All urban settlements could be grouped by shading, symbol or colour according to their predominant function. Further, the whole of the road pattern and the density of its traffic flows might be shown, were the data available on a suitable scale for all roads. This dynamic pattern of the urban settlement and traffic movements by road and rail might be shown *in toto* on the background of the landscape areas, but to be successful they would have to be mapped on a scale of at least 1:250,000.¹ Another solution of this problem is presented later in a study of Württemberg.

NATURAL TERRAIN TYPES

Detailed studies of small areas were made and it was found that two or more of these landscape elements frequently coincided so as to form a distinct "landscape complex" or type. The problem of classification and delimitation was first complicated by considering both the natural and the cultural elements. The fewer the variables the more consistent the results. The physical elements are all interdependent and there is a close and consistent interdependence of surface relief, rock, soil and vegetation, in spite of the transformations effected by man through clearance of the initial vegetation and the substitution of his own cultivated crop associations. The settlement pattern and the kinds of land use are man-made elements that are not subject to the same laws of association as those imposed by Nature. Nevertheless, through the close adjustment of man's activities with his changing objectives and techniques to the land there is a close association of particular economies and types of land use to the facets of the natural environment. In other words, there is a frequent coincidence of local differentiations of land use and rural settlement pattern with the physical conditions, even though the same cultural phenomena are not always associated with the same physical conditions. *In short, throughout this study the interrelated phenomena of relief, soil and vegetation were taken as the primary criteria of differentiation of terrain areas. Settlement and especially land use show intimate ecological adjustment to the variations of local physical conditions. The man-made features of the landscape are often clear indicators of terrain conditions and boundaries. But settlement and land use, while listed in the terrain*

¹ In this connection, attention should be drawn to the map of Switzerland prepared by Hans Carol of the University of Zurich that makes a very successful attempt to achieve just what we have been discussing, and it is sufficiently near Germany to be of particular interest and is of special importance as indicative of a distinctive geographic contribution.

*descriptions, were never used as determinants of terrain types or boundaries, except in the case of urban areas.*¹

The scheme of terrain types is given below. Samples of the areas, taken direct from the 1 : 100,000 map series, are shown on Figs. 108 to 120.

The analysis and grouping of the phenomena of the landscape in both countryside and town on these lines presents a portrayal of what we have described as the geographic landscape or the human habitat. Such study is concerned with the *form* units of the earth's surface and the analysis and interpretation of these unit form areas is a main goal of geographical study. Our first aim here has been to work out and map a classification of types of landscape or countryside. The explanation of the natural, man-made, and man-modified elements, and their areal interrelations, is the ultimate goal of geographic study and we shall try in these pages to account for some of these phenomena in the light of the history of human occupancy and of the present activities, movements, and organization, of society in the German lands.

Key to Terrain Types

1a. *Alluvial Plains.* River valleys. Liable to flood. Heavy clay or loam. Damp woodland with alder and poplar; intermixture of oak and hornbeam ash and elm on drier sites above flood level. Drained meadow, for grazing or mowing. Valleys in Brandenburg have fen formations and mature alder wood (*Erlenbruch*).

1b. *Alluvial Plains.* Alluvial clays or heavy loams above flood level, though water-table near surface. Many small streams. Oak-hornbeam on damp brown forest soils. Dominantly arable and/or meadow. Compact villages.

1c. *Marsh or Polder.* Flat at or below sea-level. Diked and drained. Heavy clay or loam. Halophile native grass communities. No woods, mainly meadow land. Close net of drainage ditches. Linear settlement along roads and canals, or isolated settlements on raised hills (*Wurten*).

2. *Undulating or Flat Land.* Clay or loam. Grass and/or arable. Woods; initial vegetation varies, damp oak-hornbeam in northwest, beech wood in northeast, spruce in Bavarian Plateau. Hedged or fenced fields.

2a. *Undulating or Hilly.* Shallow lakes. Heavy loam. Beech woods or pine woods in northeast, spruce in south. Mainly arable (grain and fodder crops) with hedged fields and copse and woods.

3. *Low Plateau of Sand and Gravel (Geest).* Oak-birch woods, with heather and bracken on acid soils. Mainly cultivated with scattered patches of heath,

¹ It will be apparent that a scheme of digits might well be used in such a detailed mapping project. The determinants of landscape in our usage are 1, surface relief; 2, soil; 3, vegetation; 4, land use combination. Each of these must be classified and appropriate digits might be used as listed in the preceding paragraphs. It was found simpler, however, in this study, since the several phenomena are often interrelated to give a certain type of landscape, to use a simple system of single numbers. This procedure applies to detailed work, either directly on the map or in the field.

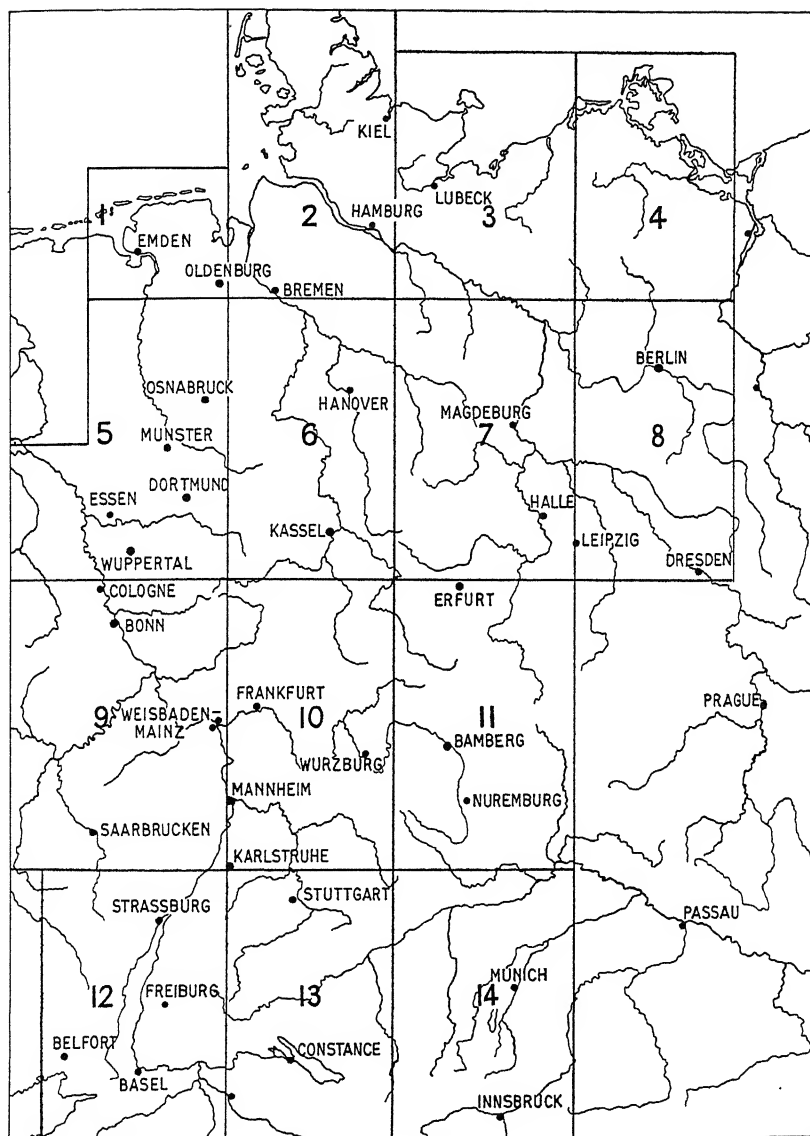


FIG. 62—GERMANY: KEY TO MAPS OF TERRAIN TYPES (scale, 1 : 6 m.)

This key map refers to the maps that illustrate the following chapters.

For the detailed features of each sheet, reference should be made to Figs. 4 (Land Forms), 11, (Soils), 12 (Vegetation), 13 (Physical Units), 24 (Rural Settlement) and 31 (Land Use). All these maps are on the same scale.

bog and wood. Open fields on heath, ditches on bog. Isolated farmsteads or open cluster of farmsteads (*Eschdorf*).

3a. *Low Plateau of Sand and Gravel*. Dominantly heath and bog with scattered patches of cultivation. Mainly fen (*Flachmoor*) (sedge swamp) or bog (*Hochmoor*) (sphagnum mosses and heather-like shrubs).

3b. *Low Plateau of Sand and Gravel*. Reclaimed fen and bog with peat cuttings; land cultivated with canals and ditches. Linear settlements. Ecologically this is the same as 3a and is due to reclamation.

4. *Low Plateau of Sand and Gravel*. Dry. Forested.

5. *Undulating or Flat, Loess-loam soils and dominantly arable*. Hedgeless fields, compact villages with no dispersed farmsteads. In northwest, oak-hornbeam, hawthorn, guelder rose and alder, and rich ground flora. Drier and warmer conditions on the loess in central Germany. Patches of steppe-heath, flora in drier sheltered warm areas on edges of the Rhine Rift, in the valleys of the Central Uplands, and the middle Elbe basin. 5a. As 5 but occasional hills and woodland.

6. *Undulating Land on Horizontal Limestones or Marls*. Thin heavy loam soil. Beech woods on good well-drained soils with continuous ground flora. Dominantly arable (up to 70 per cent of total area), frequent patches of wood and copse. Sections of oak-hornbeam on drier and warmer soils. Compact villages. Frequent patches of wood and copse.

6a. *Hilly Land on Horizontal Limestones*. Mainly cultivated. Frequent wooded hills. Regular average slopes of 5-10 degrees. Rich beech woods.

6b. *Undulating or Hilly Land on Limestone*. Wooded plateaus (*Côtes de Meuse and Moselle*) and steep-sided monoclinal ridges in the *Weserbergland*. F = Wooded.

7. *Undulating Lowland on Heavy Clays*. Many streams and lakes, beech woods on acid soils with scanty ground flora. Over half open arable but some hedged fields and pastures. Small villages and isolated farmsteads, e.g. *Keuper lowland* and the *Wœuvre* in *Lorraine*.

8. *Rhine Plateau, Undulating, Open*. Beech forest, few species, on wet, acid soils. Loam soil often on limestone or patches of loesses. Over 70 per cent cultivated (arable and meadow) with some wood, e.g. northeast to southwest strips in the *Eifel* on limestone outcrops, the *Condruz* in *Belgium*, and the *Westerwald* basalt plateau.

9. *Rhine Plateau, Low Altitude* (250-400/500 metres). Undulating with deep steep-sided valleys. Forested clearings, much coppice and scrub. Thin clay soil. Beech forest, few species on acid soils.

9a. As 9, deeply dissected, thickly wooded, with intervening high, level, cultivated interfluvies, e.g. *Voreifel* and the plateau flanking the *Rhine gorge*.

10. *Rhine Plateau. Undulating middle altitude* (over 400-500 metres). Dominantly forested (beech) or bog on acid soils with occasional deep gorges, e.g. *Hautes Fagnes* and the *Hohe Venn*.

10a. As 10. Deeply dissected and forested, e.g. *Hohe Eifel* and *Siegerland*.

11. *Rugged Highland* (600-1,000 metres). Deep valleys cut into resistant granites, gneisses and quartzites. Dominantly forested, some fneadow in clearings.

12. *Plateau on Horizontal Sandstones.* With deep, steep-sided valleys, acid soils, few clearings. Bunter sandstones, e.g. Hardt, Odenwald and Spessart.

13. *Urban Terrain.* Outline of urban areas with over 100,000 people. Circles for urban areas with less than 100,000. Semi-urban areas shown by hatching.

These terrains of the west German lands are shown on a series of fourteen maps in the following chapters, and the above is the standard key. Naturally there are some deviations from the norms from one part of the country to another, and these are indicated in the individual captions. The geographical names inserted in these maps are of two kinds. There are first the names of relief features. These are old-established names of relief areas such as the Black Forest and the Odenwald. Others, such as the Upper Rhine Plain, are academic terms, coined by geographers and geologists, and in common usage by them. Second, there are the names of human geographical units that are not now, and in some cases never were, political units. They are the equivalent of the French *pays* and *province*. Examples are Kraichgau and Breisgau, and the Hellweg and Haarstrang in Westphalia, and district names with the suffix *land*, as in the Northern Lowland.

A skeleton key is given for each sheet. The sheets are arranged in order from the northwestern corner eastwards. The general disposition and character of the major physical units on each sheet will be found by reference to Fig. 13. The sheet lines and numbers are shown on Fig. 62. The maps are meant as a source of reference for the detailed study of any particular area.

TERRAIN AREAS: THREE EXAMPLES

This mode of detailed procedure may be illustrated from a recent study of the lower Rhineland.¹ (Fig. 63.) The area in question lies on the left bank of the lower Rhine between the river and the edge of the high terrace west of Moers. It is the Moerser Land. This area lies on the lower Rhine terrace. It is a much subdivided area, containing many small island-like blocks that average only a few hundred metres in width. These are called locally *Donken*. They are separated by many low-lying flat channels (*Kendeln*) about 200 metres wide. The latter were formed by the shifting of the distributaries of the Rhine in the lower terrace. They are today, for the most part, abandoned, occupied by small streams and lakes, some of which are partly filled in. There are many dry channels on the *Donken* that are only occupied by water in spring and autumn when the water-table is high. The hydrography of this whole area—the seasonal and unperiodic changes in the level of the water-table in the

¹ K. H. Paffen, "Ökologische Landschaftsgliederung", *Erdkunde*, II, 1948, p. 167.

Donken and the old channels—affects the whole process of soil formation, vegetation growth and, in considerable measure, the mode of human occupation.

This is illustrated by one of the channels between two raised *Donken*. Here is found a sequence of natural vegetation within a distance of several hundred metres. Waterlogged silt and peat bog occupy the centre. This is succeeded on progressively higher and better drained land by: sedges and reeds; willow and bird cherry bush; wet alder wood; poplar and alder woods with grass meadow; damp oak-hornbeam wood; a wider zone of grass and meadow; and finally, a narrow strip of oak-hornbeam woods on the edge of the channel where it merges into the raised *Donken* platforms. On these platforms the initial oak-hornbeam woods have disappeared and have been entirely displaced by ploughed land. There is thus a close interdependent association of the natural phenomena of hydrography, relief, micro-climate, and soils. But, today, we generally find a uniform cover of meadows and pastures in these channels that has supplanted the varied native vegetative growth through occupation by man. In sharp contrast are the *Donken* that are only two or three metres higher. Here the ground water appears only in narrow strips of meadow in the lower channels that were formerly occupied in the natural landscape by the moist oak-hornbeam woodland. Moraine and dune, and sand and gravel deposits of the lower terrace, have leached soils with a partially developed pan (*Ortstein*) with three horizons (A, B and C). These carried a natural vegetation of oak and birch and *calluna* heath in such a dry habitat. Here too are recent pine plantations. The somewhat better-developed sandy-loam soils with a brown colour on the alluvial lands carry oak-hornbeam and oak-holly wood. This native woodland today appears only as occasional remnants, for most of it has been displaced by farmland.

Thus, in sum, the old river beds (*Kendeln*) today carry damp alder and willow woods and meadows. The *Donkenplatten* are arable farming lands. Birch coppice and heath and pine woods occupy the dunes, and oak-birch and beech woods occupy the hill remnants of the old (Saale phase) moraines. These are the four constituent landscape types of this area. They are all four clearly defined natural ecological "sites". Each is a *Landschaftzelement* according to C. Troll but, according to Paffen, might more appropriately be called a *Landschaftszell* or landscape cell, whereas the individual components, i.e. relief, soil, plant cover, land use, are described by Paffen as landscape elements. This particular areal association of landscape units finds its limit in the Moerser Donkenland, the name of which is derived from the small town of Moers. This is a "stow".

The whole of the Rhine plain from Neuss-Düsseldorf northwards to

Xanten-Wesel, of which the Donkenland forms a part, merges into the river marshes of the lowest course of the Rhine, and to the east and west it is bounded by the steep edges of the High Terrace. This plain is associated with the Moerserland by the same association of broad sunken channels and raised blocks or *Donken* in the lower and middle terraces.

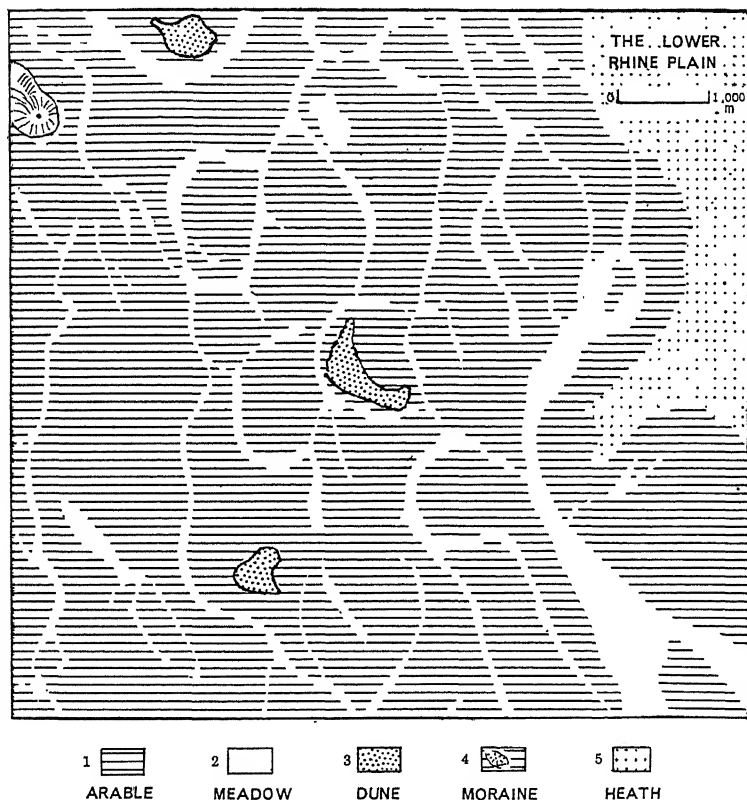


FIG. 63—THE TERRAIN AREAS OF THE MOERSER LAND IN THE LOWER RHINE PLAIN (from K. H. Paffen) (scale, c. 1 : 100,000)

Key:

1. *Donkenplatten*, loam-covered, dominantly arable, having replaced the original indigenous vegetation of oak-hornbeam and oak-birch.
2. These are channels, either dry and dominantly meadow, formerly under moist oak-hornbeam woods; or abandoned channels (*Kendeln*) with some water courses, meadow and rough grass and remnants of wet woods (alder and poplar).
3. Dunes with scrub and heath and oak-birch remnants, and pine plantations, on the Lower Terrace.
4. Morainic hills with oak-birch woods.
5. Moerser Heide, another distinctive complex of sites. In detail, this is a complex pattern. The valleys (*Donken*), sometimes with a width of only 300 m., have a variety of natural vegetation from bog to the edge of the arable plateau. But the whole valleys are today usually under permanent meadow.

This whole zone of the lower Rhine plain, of which the Moerserland is a part, is described as an *Einzellandschaft*. It is a "tract". It belongs to a grouping of similar contiguous units of the same category in the alluvial plain of northwestern Germany, in each of which there are combined: meadow-covered troughs, higher fertile arable terraces devoted to arable land, platforms with oak-birch remnants, heath and pines in the sandy areas, and higher wooded morainic hills. This whole unit is the Lower Rhine Lowland (*Niederrheinische Flachland*). This is a *Grosslandschaft*. Such an area fits into a still larger pattern. It clearly belongs to the great raised delta lands of the Rhine, Meuse and Scheldt. This in turn is a component part of the North German Lowland, and this again is a component of the *Landschaftszone* Mitteleuropa and this in turn of the *Landschaftsgürtel* of the Temperate Zone. The arrangement is shown below in tabular form.

Orders of Landscape Units (after K. H. Paffen)

<i>Landschaftseinheit</i>	<i>Examples</i>
Landschaftszelle ..	Donkenplatte, Kendelniederung
Kleinlandschaft ..	Moerser Donkenland (Rhine Plain)
Einzellandschaft ..	Mittlere Niederrheinebene (Lower Rhine Plain)
Grosslandschaft ..	Niederrheinisches Flachland (Lower Rhine Lowland)
Landschaftsgruppe	Scheldt-Meuse-Rhine Plateau
Landschaftszone ..	Mitteleuropa (Central Europe)
Landschaftsgürtel	Gemässigter Mittelgürtel (Cool Temperate Belt)

Two other such studies are shown in Figs. 64 and 65.

Fig. 64 is a section of the Bergisches land, about 15 km. northeast of Bonn. The following sites or ecotopes are shown: 1. Horizontal lines show the level plateau covered with loess-loam, and mainly under arable cultivation. 2. Curved double lines show wide and shallow valleys on the plateau at the valley-heads, with hamlet settlements and some market gardening. 3. Stippled areas show the loess-covered, less steep, valley sides, covered with arable or woodland. 4. Alluvial fans, shown by conventional signs, lie where the side streams enter the main valleys. 5. The latter, with alluvial floors covered with meadows, are unshaded. 6. Gravel terraces, shown by small circles, lie in the top left section. The repetition of this association of *Fliese* (sites) results in a distinct landscape association or *Fliesencomplex*.

Fig. 65 is a section of the Northwestern Lowland. It covers part of northern Oldenburg and eastern Friesland. It includes parts of the Geest ridge and of the Hunta-Leda plain. The following *Fliese* or ecotopes are shown: 1. Flat areas with a high water-table and bog soils; formerly wet alder woods. 2. Gently sloping upswells with wind-blown

sands over ground moraine; good natural drainage; generally used as *Esche* (patches of ploughed land with heavy manuring). 3. Dunes, with a low water-table, dry. 4. Wind-blown hollows (called *Schlatts*) that are submerged by water after rains. 5. Higher, flat, sand areas, with poor natural drainage, but fairly low water-table in summer; mainly heath and forest soils. 6. Raised bog (*Hochmoor*), heath, mainly under cultivation.

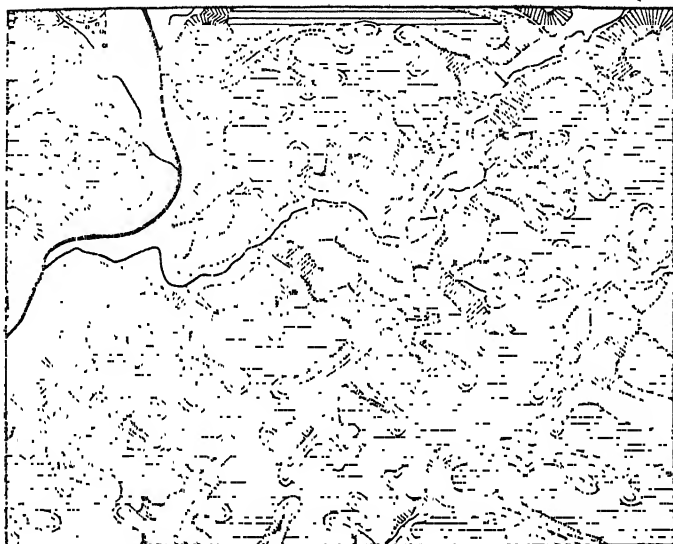


FIG. 64—THE TERRAIN AREAS OF THE BERGISCHES LAND IN THE RHINE MASSIF (from Troll) (scale, c. 1 : 100,000). For key, see text, p. 414.

If this map is reduced by half (to the scale on which our terrains were mapped), the detailed facets could not be shown. The generalized terrains (see p. 408) would be Terrain 8 and Terrain 1 (see Fig. 68, p. 430, 431).

7. Raised bog, drained with the peat cover removed. 8. Low bog (*Flachmoor*) in the Leda valley. 9. Low lying flat areas, with sand-loam soils and high water-table, partly peaty; this is transitional between 1 and 2 above. 10. Low-lying, flat, bog areas, with sandy base, permanent high water-table; formerly wet alder woods with transitions to raised bog. These are the ecotopes or sites of this general area. They are locally combined to form *Fliesencomplexe*, which are the smallest geographic units or stows. They are numbered and subdivided. I is *Geest*. This is covered by the historical unit of the *Ammerland*, with its historical nucleus in Ix, separated from Friesland to the west by a moor (Id). II is the old (Saale) glacial trough of the Hunte-Leda Valley. It contains the *Moor* complexes IIa and IIc, old negative areas, that have been reclaimed in recent times; and the lower-lying valley—bog and drier

areas of blown sands and dunes—that were areas of early settlement (*Esche*).

PHYSICAL UNITS OF WESTERN GERMANY

Our own study did not involve such exhaustive mapping of the terrain. Nor did we attempt to build up a hierarchy of units. We sought to recognize a limited number of clearly recognizable landscape *types* that could be consistently and legibly mapped over the whole of Germany on a scale of 1 : 200,000.

Consideration of the list of types on p. 408 and of any one of the 1:1,250,000 maps will reveal that the same kinds of landscape appear in widely separated sections of the country. Flat, sand and gravel country, completely covered with coniferous forest (4), occurs on the gravel terraces of the lower Rhinelands as well as in the upper Rhine valley, and on the Bavarian Plateau. Forested plateaus on horizontal sandstones are clearly coincident with the outcrops of Bunter sandstones. Similarly 2 and 2a are associated with a rolling ground-moraine relief and the hummocky terminal-moraine relief of northeastern Germany and of the Bavarian Plateau. But, while the landscape area is often a replica of the geological map, the latter was not adopted as the primary basis of delineation. In some areas geological maps on a suitably large scale were not even available. One type of country often cuts right across several geological outcrops, a fact that is familiar enough to the geomorphologist.

While the same kind of country occurs in widely separated areas, it will also be apparent that contiguous landscape types fall into groups that form physical units. In this way, the great detail of the mosaic can be readily simplified into units of different orders of magnitude. The river plains are self-explanatory as are the polder lands that lie along the coasts of northern Germany. Similarly 3, 3a, 3b and 4, when grouped together, include the extensive areas of glaciated surface in the Northern Lowland and the Bavarian Plateau. The Geest, bog, reclaimed bog lands, and woodlands, of the northwestern lowland embrace the varied patterns of 3 and 4. Particularly outstanding, and of great importance in the history of human occupancy, are the open, arable, well-drained lands of 5 and 5a. These form a distinct zone along the northern edge of the Central Uplands, with many patches in central and southern Germany. The Rhine Plateau (8 to 10) has a great local diversity of country but forms one physiographic unit. The same holds for the Upper Rhine Plain, its flanking highlands (11 and 12), the South German Scarplands (5, 6, 7), in which the landscapes correspond broadly with *groups* of geological outcrops.

Comparison of the maps of relief, soils and vegetation will reveal the

closest coincidence of these three elements, based, in fact, on their causal interrelationship. On this basis clearly defined physical units may be recognized that contain a group of the associated landscape types.

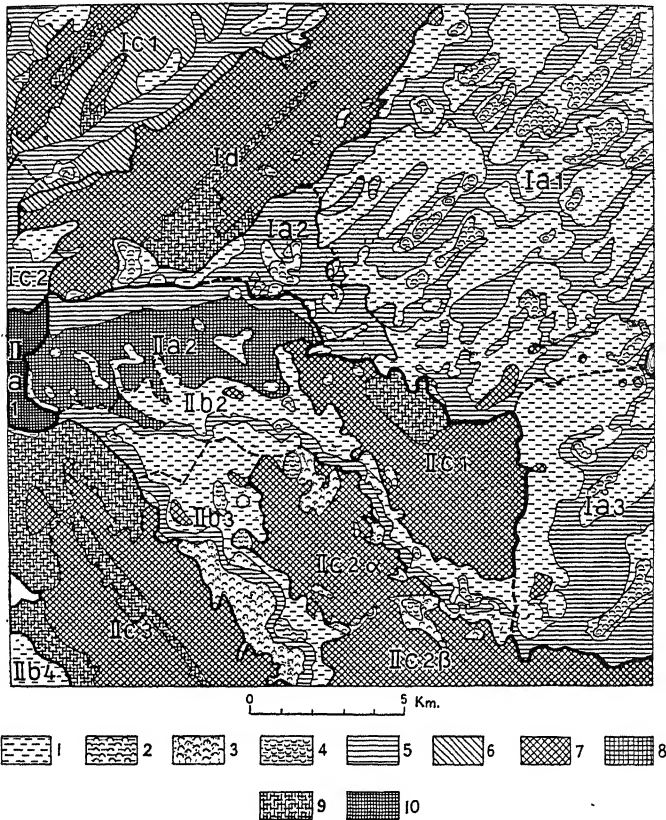


FIG. 65—THE TERRAIN AREAS OF THE NORTHWESTERN LOWLAND
(prepared by Amt für Landeskunde) (scale, 1 : 250,000)

For key, see text, p. 414.

These terrains, reproduced here on a scale of 1 : 250,000, (approx. the same scale as our terrain maps), were actually mapped on the scale of 1 : 25,000 and then reduced (see Fig. 84, p. 518).

Each of these major physical units is not only distinctive as to its relief, but, in proportion to this uniqueness, has general features of temperature and rainfall and, in large measure, of native vegetation that permit its recognition as a unit in Nature, that is, a natural unit. All the maps of western Germany, for example, reveal the uniqueness of the Rhine Plateau or the Rhine Rift. This is also true of the landscape units, since each has a distinctive combination of natural conditions, to which

there is a close adjustment of the cultural elements of human occupation. Fig. 13 is generalized from the detailed landscape areas and shows the main physical units into which western Germany may be divided. These are the same regions as indicated at the end of Chapter 3, Part I.

HUMAN OR FUNCTIONAL UNITS

The patterns of areal differentiations of the natural terrains are clearly reflected in the adjustments of human occupation and organization. It would be false, however, to assume that the latter can be determined adequately in terms of the terrain. Human functional differentiations must be examined *per se* in the details of their areal texture in terms of the human activity and in terms of the reflection of this activity in the man-made habitat.

The particular modes of grouping that concern us in the German lands are those that are related to the habitat on the earth's surface. Thus, a German family may live in a farmstead that lies in the midst of its own fields or in a village with other farmsteads. The holding may consist of a number of scattered strips or it may be compact. It is thus a *functional* unit. The village is a community above the farm holding that, in varying degree, can only be appreciated in the light of its history. It is a social, an economic, and a political grouping. The village community is the centre of a clearly defined district or *Gemeinde*, though the size and shape of the *Gemeinde* vary greatly, as does the mode of grouping of the farms and fields within it, since these depend on its social and economic history. The village, too, is a functional unit. The individual peasant holding or the group of holdings in one village group (that for centuries was organized on a communal basis) may lie entirely within one type of country or may include sections of several types of country, or simply small topographic facets of the same terrain, such as woodland, meadow, arable or heath. Several sections of diverse facets make up one functional unit (a holding) or a group of adjacent farms that might, especially in Europe, as in most of the Old World, be a communal village group.

The same mode of farming of such a small group may be repeated in neighbouring villages so as to form an area of common farming practices. These common practices are reflected in the character of the country landscape or the modification of it to suit new practices, and in the mode of utilization of the land, and in the arrangement and disposition of field, wood, and meadow, and in the disposition of the buildings. Factories and non-rural homes and services may occur in such a countryside, and their character, distribution and interrelations with each other must be explained. The village community and its neighbouring villages may be a

part of a complex in which industry and agriculture are intermingled. The nature of this complex is examined in relation to the actual character and arrangement of the phenomena on the land. The outside group, beyond the village community, may be similarly examined in regard to language, traditions, folklore and the like. In other words, in these cultural aspects the village always forms a part of a wider geographical circle of cultural associations. These areal groupings are, then, economic, social, and political. They are all *functional* units, as opposed to the *form* units that occur in the geographic landscape.

This geographic interpretation of Man on the Earth goes much further. Variety has been the essence of peasant and village life in the self-sustaining economies of historic Europe. This local variety of production within one holding and between adjacent villages is the basis of the local exchange of products and services. And the centres in which such transactions are concentrated assume a special character that we call urban. One of the most important activities of the small country town is to organize the exchange and provide the services for adjacent countrysides, that are contrasted and may be supplementary in their special surplus outputs and in their common needs. Similarly such urban centres are needed everywhere and must be in close contact with the countryside to provide their essential requirements from outside; the chief of these products in the past have been such as salt and iron and wines. The small country town is above all else a seat of trade and crafts and such seats are particularly active at the junction of two contrasted countrysides. This, however, is only one factor in urban growth, for even in large stretches of the same country, towns are needed and are fairly evenly spaced so as to reach all the country folk. The social needs of religious worship and the administration of justice and defence are also supplied by such centres.

The growth of seats of specialized production at fixed places as seats of primary production and as trading centres, as well as the increased number of centralized services to serve the countryside, greatly complicate the pattern of settlement. And of greatest importance in our day is the expansion or explosion of the urban agglomeration. Urban activities, such as golf courses and factories, may be detached from the main urban areas. The dwellings of urban workers may be miles away from the office in the city, so that there are many complicated patterns of human occupancy and distribution around the urban agglomerations that spread over the countryside. These must be determined and explained by the geographer as to their location, patterns, origins, and space relationships.

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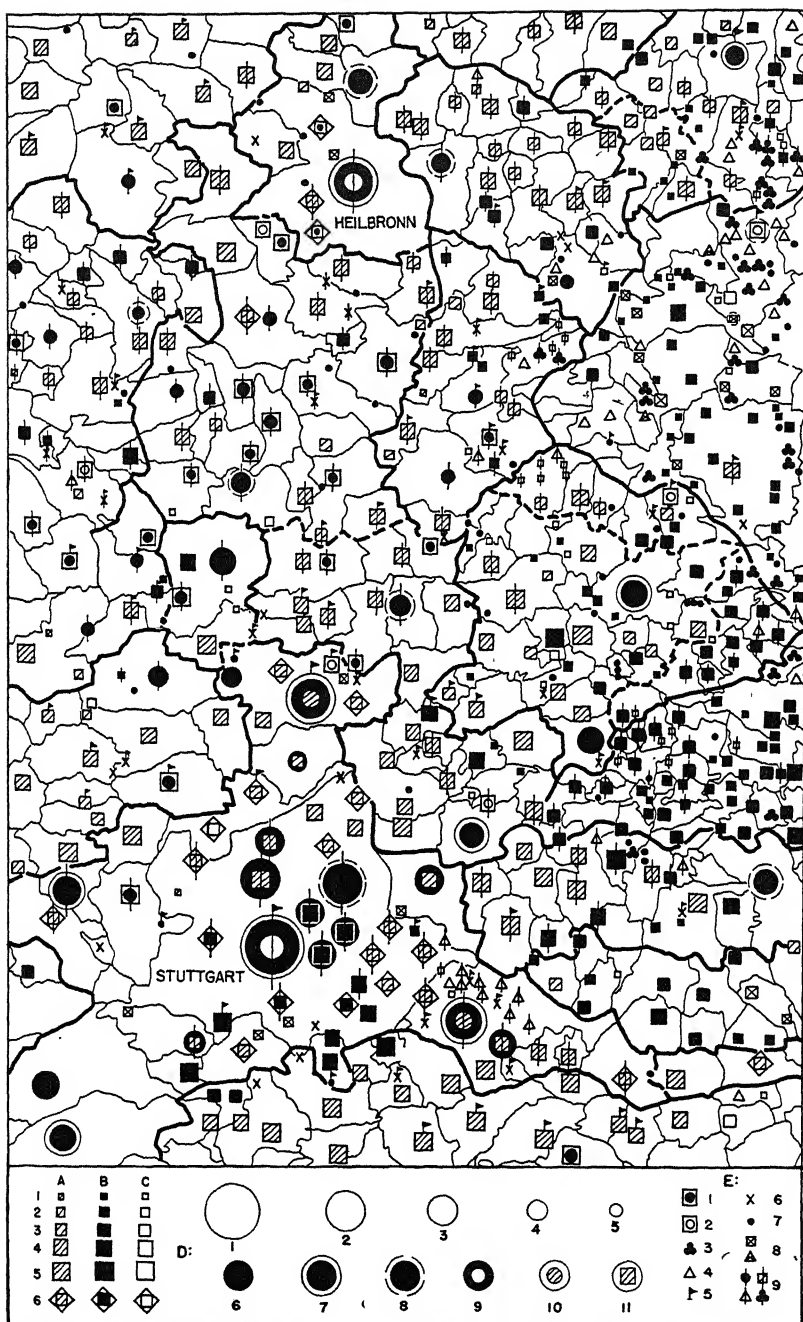


FIG. 66—THE SETTLEMENT STRUCTURE OF THE NECKAR BASIN: I. SETTLEMENT TYPES (after Huttenlocher) (scale, c. 1 : 400,000) *
[For key see next page]

AN EXAMPLE FROM WÜRTTEMBERG

Attention has been drawn to the character of the smallest ecological units on the earth's surface and the method whereby they can be determined as assemblages of minute units (or sites) in selected areas. The local areal variations of human occupancy may be similarly investigated. The smallest functional unit in a landscape is the clustered settlement and the local area around and associated with it. Such is the *Gemeinde*. A contiguous group of similar units is comparable to a "stow" or an assembly of "sites". The character of such a *Gemeinde* may be determined in terms of its functional structure, its historical development, and its population. On this basis, Huttenlocher has suggested a classification of all settlements in Württemberg and has mapped the cultural units. Figs. 66 and 67 show the Neckar valley area.

The following types of rural settlement are recognized on the basis of their origin. The irregular nucleated village characterizes all the earliest settled lands.¹ Three variants are recognized. The old villages in the

¹ The term *Etterdorf* is suggested for this village, that developed in association with an economy based on grain in rotation with fallow for pasture. This system demanded that the groups of arable strips be temporarily fenced in order to keep the stock off the grain land. Each group of strips that was worked communally was called a *Zelge*. Around the compact cluster of central farmsteads a permanent fence was built beyond which no houses were allowed to be built on the communal lands. This was called the *Etter* (or *Gatter*). When such a nuclear settlement grew in size it became what is called a *Gewandorf*. The alternative name of *Zelgendorf* is not used, since it suggests the kind of field system which may have disappeared today. (See Huttenlocher.) (Refer also to Ch. 6.)

Fig. 66.

A, B, C (left): *Types of Village*:

A. Old clustered village; B. Later clustered village, mainly in medieval forest clearings; C. Recent post-medieval villages

Size according to symbol.

- | | |
|-------------------------|--|
| 1. Under 75 inhabitants | 5. 1,600-4,000 |
| 2. 75-200 | 6. Over 4,000 (an urban village or an urban outlier) |
| 3. 200-600 | |
| 4. 600-1,600 | |

D (centre): *Towns*: according to size.

- | | |
|--------------------------------|--------------------------------------|
| 1. Large | 7. Administration |
| 2. Medium | 8. Formerly administration |
| 3. Small | 9. Cultural |
| 4. Country | 10. Formerly cultural |
| 5. Dwarf and dominant function | 11. Recent town with village nucleus |
| 6. Industry and commerce | |

E (right): *Other village traits*:

- | | |
|---|---|
| 1. Fortified clustered village | 6. Demesial settlement (<i>Gutshof</i>) |
| 2. Clustered village originating as a founded town | 7. Single farmstead (<i>Einzelhof</i>) |
| 3. Open hamlet (under 75 inhabs.) | 8. Settlement with a non-farming origin |
| 4. Open village (over 75 inhabs.) | 9. Vine-growing settlements |
| 5. Early seats of secular and ecclesiastical authority (castle, residence, monastery) | |

The investigation is based on the smallest socio-economic and administrative units, the *Gemeinde*. Their boundaries are shown by fine lines. Heavy lines are boundaries of the smallest unit-areas of settlement structure (*Siedlungsgefüge Einheiten*), dashed lines are sub-unit areas,

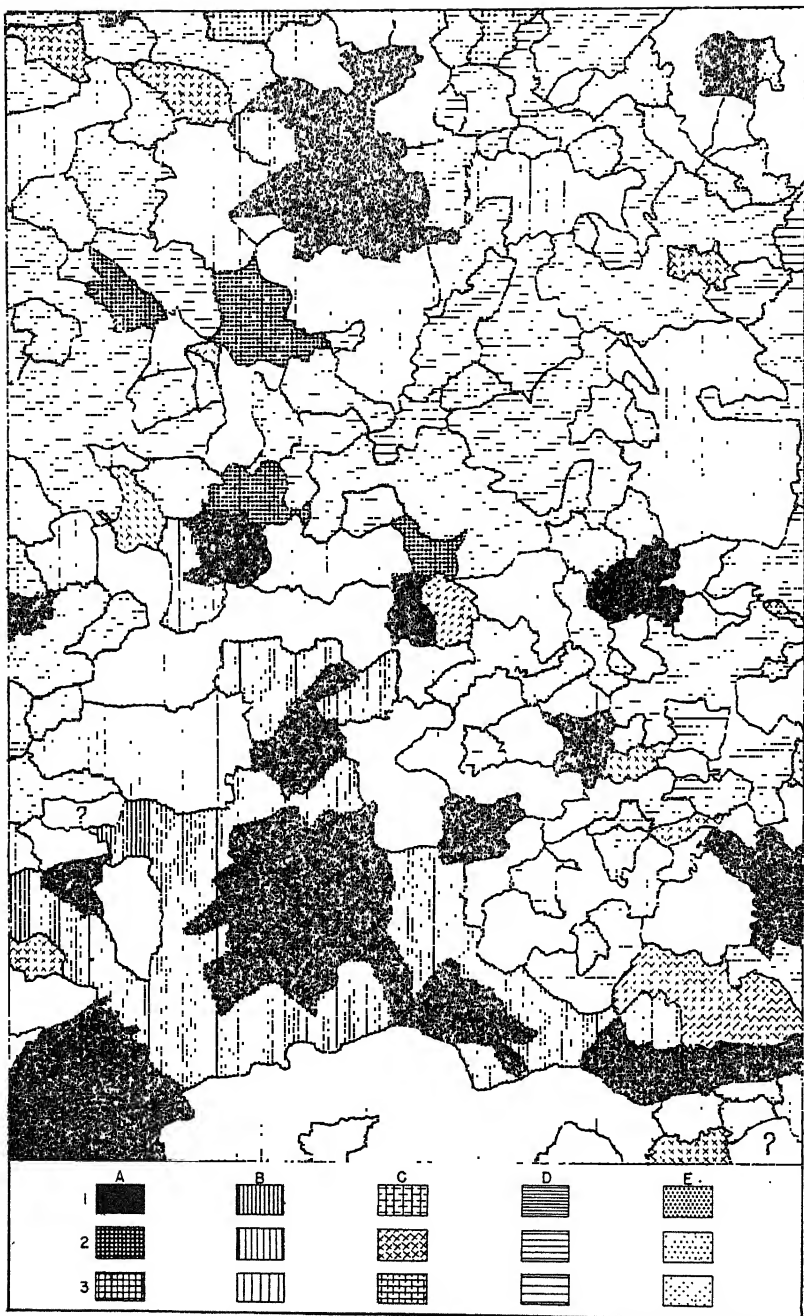


FIG. 67—THE SETTLEMENT STRUCTURE OF THE NECKAR BASIN: II.
 FUNCTIONS OF THE *GEMEINDE* (from *Huttenlocher*) (scale, \bar{L} 1 : 400,000)
 [For key see next page]

first settled land (*Altsiedlungsland*) are usually large with relatively fertile soils and a large village area. Many were associated with nobility and have one or more large estate-farms (*Güte*), especially in the Alb. The majority have over 600 inhabitants, though some lie in the 200–600 group. Later villages were established as clearings in the forest and extended as far as grain cultivation was possible. The arable strips are arranged in small groups and are clearly distinguished from the meadows, that cover a larger area than in the old villages. The common pasture (*Allmende*) is usually absent, the farms form a loose group, and there was not the territorial subdivision among various ground lords as in the old village. Early and diminutive forms occur in south Germany and are especially characteristic of Upper Swabia, and they closely resemble the *Drubbel* of northern Germany (p. 134).

A second group are the hamlets (*Streuweiler*) that emerged without any communal compulsion on the method of farming. They occur in areas that were not suited to grain but to grass, and the *Feldgraswirtschaft* as opposed to the three-field system (*Dreifelderwirtschaft*) was used, so that individual use of compact properties permitted a wider choice of the site of farmsteads. Many also grew from single farmsteads established during the age of forest clearance. Grass economy is dominant, land is often broken up by rough topography, forest plays an important part in the economy, and communal woods and pasture (*Allmende*) are lacking. Separate and compact fields are predominant, as opposed to the open-field system (*Gewannflur*) in the old villages. Such settlements have normally less than seventy-five people, although the presence of one or more institutions may raise their population; such are called *Streudörfer*.

With this hamlet-type of settlement is genetically associated the isolated farmstead (*Einzelhof*). The "forest village" (*Waldhufendorf*) is a fourth type. It was a colonized settlement in which the holdings were compact and adjacent to the farmstead. The type is called a *Zinken* in the Black Forest. Vintners' villages are not genetically a separate type, since they have usually grown out of irregular nucleated villages, but acquire distinct character through their predominant functions. For the same reasons, many small settlements developed in the medieval period as non-farm communities, such as clusters around a castle or church, with very

Fig. 67. Through statistical analysis the *Gemeinde* are arranged in five groups, with three sub-types within each group, (1) exhibiting the characteristics fully, (2) being intermediate, and (3) having the strongest rural element.

A. Urban. (1) central places or "towns", (2) industrial *gemeinde*, and (3) industrial *gemeinde* with a significant farming element.

B. (1) and (2) residential *gemeinde* of non-farm workers, and (3) the same with a significant farming element.

C. (1), (2), and (3) non-farming and farming *gemeinde*.

D. (1), (2), and (3) small farmers' *gemeinde*.

E. Medium and large farmers' *gemeinde*.

The unit area of this statistical study is the *Gemeinde*, as shown on the previous map.

little farm land apportioned to them (i.e. with a very constricted Mark). Such settlements of petty traders and craftsmen, holding minutely subdivided lands on a very small area, retain their distinct character to this day. In a similar category are the craft settlements in thinly peopled woodlands that were associated with glass-working in various parts of south Germany. With the decline of these crafts others were taken on and small-holdings of farmland were gradually accumulated around them. Further to be distinguished are the small medieval towns and the places that have acquired urban functions. Settlements in the countryside around towns have often acquired urban character as part of the rural-urban fringe.

On the basis of their dominant occupations and place of residence, fifteen types of Gemeinde community are recognized. There are three in each of the following groups—industrial gemeinde and administrative centres; resident-workers' (non-farmers') gemeinde; non-farmers' and farmers' gemeinde; small farmers' gemeinde; and large and small farmers' gemeinde. From such data it is possible to demarcate in an area the groups of its gemeinde with a common social and economic structure. Such areas find their activities concentrated in varying degree in settlement centres.

From this exhaustive study of the areal pattern of social and economic character of the Gemeinde, together with the functions and historical development of their central places, the Gemeinde were grouped into "unit cultural areas" in respect of their similarities of function and of their associations with particular centres. It was then found possible to compare these areas with the detail of the texture of the natural units. There is a very close and consistent correspondence and interdependence of the two, since the process of rural settlement and rural economy is inevitably closely adjusted in all its local variations to the kind of physical terrain. The mode of development and the present character of the socio-economic structure may vary *per se* from one area to another, but nevertheless the natural unit area often exhibits a common set of social and economic conditions, as a reflection of similar adjustments to the same kinds of site. A very marked general contrast appears between the oldest settled farmlands and the lands that were deforested and reclaimed in the Middle Ages. Minute variations are also perceptible. Small rural settlements are characteristic of the old settled land on the molasse hills and old moraines of Upper Swabia, while large compact villages with extensive areas of open arable land and numerous small-holdings occur in the Strohgaü and the Munsinger Alb. Where such clear-cut associations of the natural terrains and of social and economic areas occur, one can speak, if one will, of geographic regions, in which nature and man are in harmony.

Harmony between man and land is often disrupted by extraneous culture forces. Such forces all radiate from particular centres. The influence of local landlords, that persisted down to the end of the eighteenth century, is still evident, though their radius of influence was small. Lords and abbots, for example, were able to direct the subdivisions of farmland in the villages they controlled, or to maintain the hereditary unity of other holdings. Far more important is the influence exerted by the town merchants by directing crafts in the surrounding countryside, as in the development of the textile industry in the Imperial towns of Upper Swabia. This system became much more extensive under the *Verlager* system of the mercantile era of the seventeenth and eighteenth centuries. The spread of modern industry and residence has effected the most profound and far-spread influences on the countryside. The urbanized area around Stuttgart reveals a falling off in the intensity of industrial occupance away from the city, but extends widely through the high development of workers moving a distance to their work (*Pendelverkehr*). In 1925 a quarter of all the workers of Württemberg were commuters and a third of these worked in Stuttgart; since then the concentration has become much greater. Further away from the city, the numbers and proportion of the farming community becomes more marked. This area with its central city is a distinct industrial complex.

This is merely one example of many detailed studies of the areal variations of socio-economic structure, that serves as a parallel to the study of unit terrain areas. It is a method which is being extended under the auspices of the Amt für Landeskunde, under the direction of Dr. Emil Meynen, to cover the whole of western Germany. The investigations will take the form of a series of maps on the scale of 1:200,000. This series will then be readily comparable with the corresponding series of maps of the natural areas. A third series is in preparation on the same scale for the characterization of systems of rural economy.

MINOR POLITICO-CULTURAL UNITS

We have discussed on previous pages the nature of the small social unit, the Gemeinde and its variants, and the mode of its adjustment to the organization of rural society and the density and distribution of the population. Its formation is particularly associated with a focus. The study of the detailed texture of social organization is a matter that is receiving special attention currently in Germany. We would briefly turn attention to another aspect of the same theme.

Of particular interest among the functional groupings of society are those historic groupings which are revealed by district names. With

origins often wrapped in obscurity, such areas do not betoken, necessarily, a particular type of country, but an area that for some reason or another was regarded, and often still is regarded in popular usage by its inhabitants, as a unit. Among the oldest and the best-known are the names of physical features, especially those that are clearly defined from their surroundings, such as uplands like the Vosges, the Black Forest, the Harz, the Rhön and Vogelsberg. Many other smaller and less well-known countrysides have such distinctive names.

But these designations are not as simple as may be assumed. One may ask, for instance—and the geographer must certainly constantly raise this question—what is the meaning of the Harz or of the Vosges as geographical names? There is, for instance, a High Vosges and a Low Vosges, an Ober and an Unter Harz; to what areas do these names apply and how are the general names and the sub-titles used? For this interpretation one must refer to old maps and to popular usage. It is the same question as what, for instance, is the area designated by the name of the Cotswolds or the Weald, not in the modern arbitrary usage, say, of the geographer, but in terms of historical usage.

Many district names have their origins in the remote past, and have figured on maps and in popular usage for centuries. Such units are well known in France where they are generally described as the smaller *pays* and larger *provinces*. Exactly the same features are found in the German lands. Some of these names, in both France and Germany, have persisted in their nuclei (their boundaries always were vaguely defined in the nature of things) and their general extent from the first days of the German settlement, after the fall of the Roman Empire. The Carolingian district, known in Latin as a *pagus* and in German as a *gau*, is the same in origin as the French *pays*, which, like *gau*, has its origin in the word *pagus*. The early administrative and ecclesiastical units in all western Europe were based on preceding Gallic divisions. The Roman *civitates* were used as a base for the Merovingian and Carolingian divisions in Gaul and the Rhinelands, while east of the latter in inner Germany they were based on the tribal areas or *Volksgemeinschaften*. In spite of the bewildering complexity of the political map of the historical Germany many of these names persisted, sometimes as political or ecclesiastical areas, but sometimes they persisted in spite of territorial disintegration. Many of the most distinctive political divisions were finally liquidated around 1800 (Fig. 69, p. 432).

These are what the Germans call *historische Landschaften* or historical districts. This term *Landschaft* here means something entirely different from the literal meaning of landscape as used in English and as used in the landscape classification we have developed. It designates a human entity, that is, a functional entity, a unit of organization and life of human

society. Many of these major units have their roots in the old tribal duchies, as we shall see in later pages. Such are Swabia, Franconia, Old Bavaria and, developing as a term in the Middle Ages, Lower Saxony (*Niedersachsen*), a term that is adopted in the title of one of the new *Länder* in the British Zone. Other districts have names derived from medieval political units within which framework the lives and organization of the people developed and functioned for centuries. Examples are the old dukedoms of Berg and Mark in the Rhine Massif east of the Rhine. Other district names that are still in popular use are found, such as Baar, Klettgau and Hegau, all of these being districts in southwestern Germany between the southern end of the Black Forest and the Swabian Jura and the shores of Lake Constance. Further examples are the Kraichgau, the open and fertile limestone country between the Black Forest and the Odenwald, and the fertile farmlands of the loess zone that carry the name of *Börde* from Soest to Magdeburg. Bergstrasse is the name of the narrow fertile zone at the foot of the Odenwald in the upper Rhine valley. It will be noted that many of these districts bear the suffix *gau*. These were the names given to the earliest districts into which the settled German people were organized. The reason for their location and extent in relation to the types of country they cover needs more investigation. They are usually found to have an old settled fertile core and a surrounding border zone that for centuries offered natural boundaries in the form of forest or mountains, and their individuality was maintained in spite of political disintegration, through the dominance of one town or through the common traditions developed through the long existence of a political unit. Germany, like France, is rich in such names, the origin and meaning of which in terms of their human groups and the kind of country they cover are of particular interest to the historical geographer in his search for the relations of human groups to their habitat.

NOTE

Before reading the following regional treatment, the reader is advised to turn to the *Preface*, p. xi, and follow out the instruction given therein, with regard to the maps on the scale of 1:4 m, the terrain maps on the scale of 1:1,250,000, that are the basis of the rest of this book.

CHAPTER 17

THE RHINE MASSIF (*RHEINISCHE SCHIEFERGEBIRGE*)

GENERAL (Sheet 9, of Fig. 62; Fig. 68)

THE GENERAL features of the physique and human occupancy of this major land unit have already been examined in preceding chapters. Our objective here is to present a more detailed picture of the geography of this unit. Such a study must be based on an appreciation of the natural terrains and of the space relations of the Massif, which affect both the general and the local differentiations of human occupancy in the various sectors of the area.

The great rectangular plateau block of the Massif measures approximately 400 km. from west to east and 150 km. from north to south. It is bisected from south to north by the Rhine gorge between Bingen and Bonn and is cut again from southwest to northeast by the tributary valleys of the Moselle and the Lahn, so that the geometrical centre of the whole is the centre where these valleys converge in the neighbourhood of Koblenz. The essential unity of the Massif in its physique lies in the predominance of impervious slates, sandstones and quartzites, and indeed it is the predominance of slates that has recommended the term *Schiefergebirge* to German geologists. The block is an uplifted peneplain, that was folded in Carboniferous times into a complex series of anticlines and synclines oriented from northeast to southwest. These physical features are shown in Fig. 4 (pp. 24, 25). The general and detailed grain of the relief runs in this direction. While impervious rocks with thin acid soils make up most of the Massif, there are also remnants of Tertiary beds lying upon these and preserved in lower-lying areas, that in origin are partly lacustrine, partly fluvial, and partly remnants of volcanic overflows.

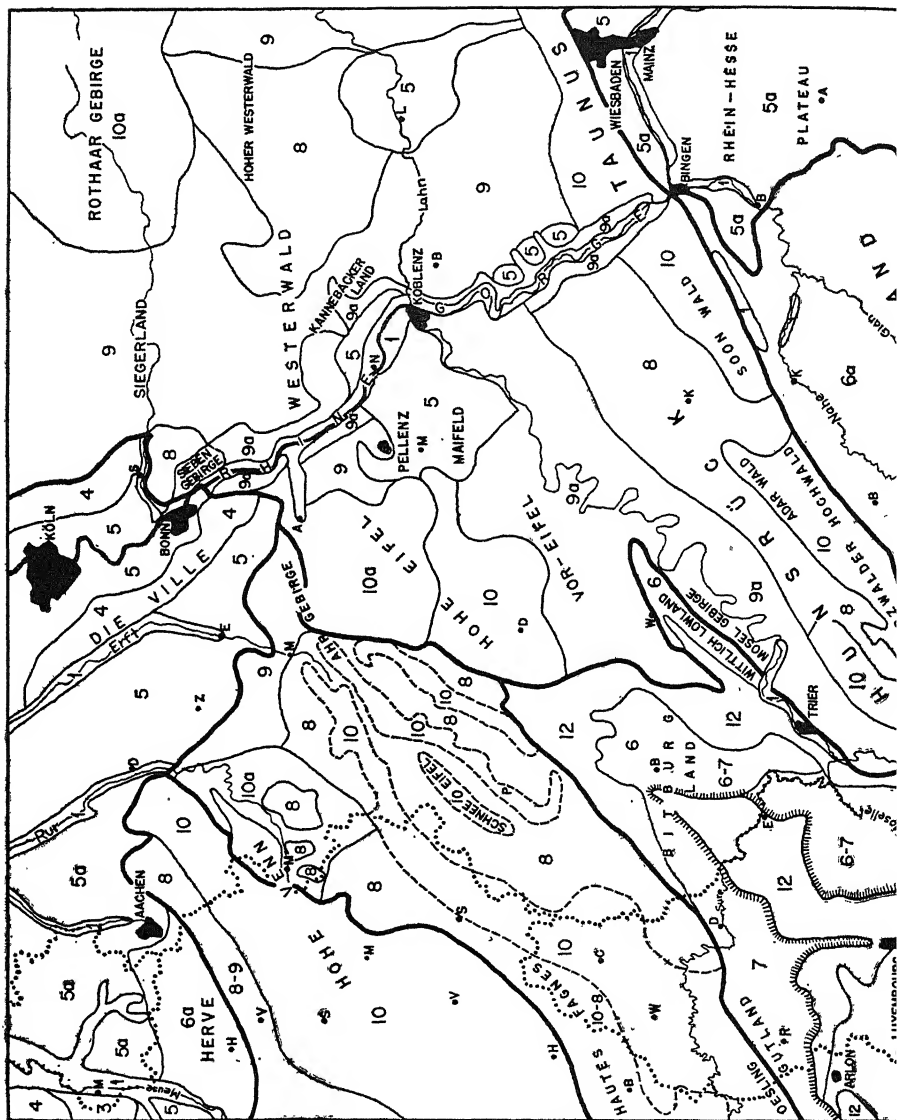
One of the most striking features of the plateau is the great expanse of smooth surfaces, broken abruptly, and without warning as one wanders on the plateau, by deep gorge-like valleys. (Fig. 4, pp. 24, 25.) Occasionally these valleys are cut so deep as to give a hilly or even mountainous relief. Long ridges built of resistant quartzite rise above the plateau level, with altitudes of 700 to 800 metres. Such are the Rothaar Gebirge, the Schnee Eifel, the Hunsrück and the Taunus. The remnants of volcanoes or craters also rise sharply from the plateau as lesser relief features. There are also depressions in the plateau surface formed by faulting and often

filled with loessic deposits. Diversity of relief at several distinct plateau levels, and the predominance of a natural beech forest, with tendencies to the formation of high bog, and a climate that becomes increasingly severe with altitude and generally wetter on western exposures and drier in more sheltered easterly exposures, are the broad basic environmental features of the plateau. These general traits of relief, soil, climate and vegetation may be studied on Figs. 4, 11, 12, 13. We must now turn to the detailed characterization of the land types viewed as the synthesis of these criteria. The results are shown in Sheet 9, Fig. 68 and the relevant classification of land types is as follows. (See Fig. 115 for type area.)

There are areas of smooth relief with a loam soil. These are usually developed on limestone, but also include the basalt area of the Westerwald. These areas are mainly under the plough and grass to the extent of seventy per cent of the area, and there is little woodland (Terrain 8). Very extensive, and more typical, are the low-altitude plateaus, usually at about the same altitude as the last areas, from 250 to 500 metres, with undulating relief, but a thin clay, acid soil resting on impervious rocks (Terrain 9). Valleys become deep and V-shaped downstream and have slopes of over 15 degrees. There is a good deal of cultivation, but much forest and coppice (*Niederwald*) surround village clearings. A higher plateau level from 500 to 1,000 metres (averaging about 600 to 700) is usually undulating. The valleys are deep, but become broad and shallow near the headstreams. There are large areas of wood and bog, and little cultivation. Deep dissection results in the complicated highland relief of the Roer-Erft basin, the Hohe Eifel and Rothaargebirge (Terrain 10). Within the Massif we need to distinguish, first, the gorges of the Rhine and the Moselle, and, particularly in the former, the loess-covered terraces that often border them; and second, the large areas covered with loess that are lower-lying and form the more fertile and sheltered nuclei of the plateau (Terrain 5).

The whole plateau falls into four sectors as defined by the diagonal crossing of the main valleys. These are the northwestern sector, the Ardennes-Eifel block; the northeastern sector, embracing the Sauerland and the Westerwald; the southeastern sector, the Taunus plateau; and the southwestern sector, the Hunsrück plateau. Finally, it will be observed that the embayments of Trier and Cologne narrow the width of the Massif in a zone of low and smooth relief that has put Trier and Cologne into relatively easy contact since Roman times. These are the terrains.

The mode of human occupance of these terrains has been largely conditioned by the space relations of the Massif. For it is easily penetrated from all sides and has thus been deeply affected by culture streams from all directions, while, again and again, the Rhine, though serving as a great



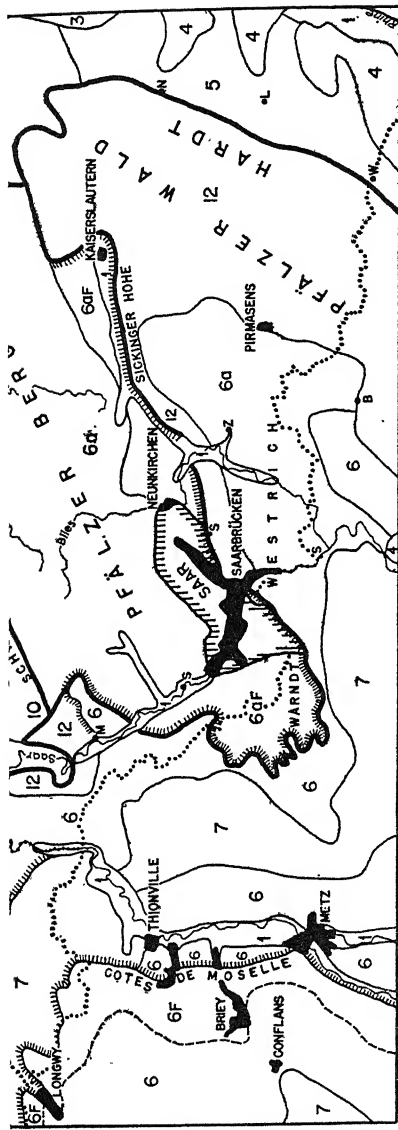


FIG. 68—TERRAINS AND REGIONS: Sheet 9. MIDDLE RHINELANDS (Rhine Massif and Rhenish Palatinate)

Sheet 9 covers the southern border of the Northern Lowland around Aachen and Cologne; the greater part of the Rhine Massif; the eastern part of the scarplands of the Paris Basin; the Pfälzer Bergland and the Saar Coalfield; the Hardt (Pfälzer Wald); and a part of the Upper Rhine Plain west of the river. Note the terrains and regional names of the Rhine Massif; the northeast to southwest alignment; the narrowing of the west part of the Massif by the lower open land between Schnee Eifel and Hohe Eifel and the northward penetration of the Bitburg Land; the Rhine Gorge, with the flat plateau or terrace remnants on its borders (5 and 9a).

1. *Alluvial Plains: Flat; Clay or loam, liable to flood. Meadow and coppice.* 4. *Low Plateau: Sand and Gravel: Forested: Dry.* 5. *Undulating Arable: Loess-Loam. Dominantly arable, well drained; compact villages.* 5a. *As 5 above, with more marked relief and well-defined valleys with meadow and wood.* 6. *Undulating: Limestone Upland: Loam. Generally open arable (50-70%). Little woodland. Compact villages. Valleys with meadow and orchards.* 6a. *Hilly Limestone or Marl Upland. Mainly arable with compact villages. Hedged pasture in Herve country west of Aachen.* 7. *Undulating Lowland with low hills on heavy clays. Much surface water. Mainly arable (50-70%) with much wood and copse.* 8. *Rhine Plateau: Undulating: Loam. Cultivated. Base of limestone, volcanics or loess. Up to 70% either arable or grass. Little woodland.* 9. *Rhine Plateau: Low Altitude (250-500 m.): Undulating or hilly, thin Clays. Deep V-shaped valleys. Much coppice (Niedervald) and many cultivated clearings.* 9a. *Rhine Plateau: Low altitude as above, deeply dissected. Thick wooded, level plateau strips between the valleys are mainly under cultivation with compact villages.* 10. *Rhine Plateau: Middle Altitude (500-1,000 m.): Undulating. Few deep steep-side valleys and deep gorges. Bog and forest.* 10a. *Rhine Plateau: Middle Altitude (500-1,000 m.): Deeply dissected.* 12. *Plateau on Horizontal Sandstones: Thin sandy soils: Forested. Deep narrow valleys. Varying stages of dissection.* 13. *Urban Terrain. Urban areas are blacked out around each city with over 100,000 inhabitants. The whole of the Saar, including partially built-up areas, is enclosed by a hatched border.*

Note. Heavy lines show the boundaries of the major physical units (Fig. 13). The German frontier is shown by a stippled line.

north-south routeway, has served also as a barrier between east and west. Cultural ingress from different directions, coupled with the control exercised on the environment by the several distinct plateau levels, has set the general framework for the human occupancy of the plateau. The

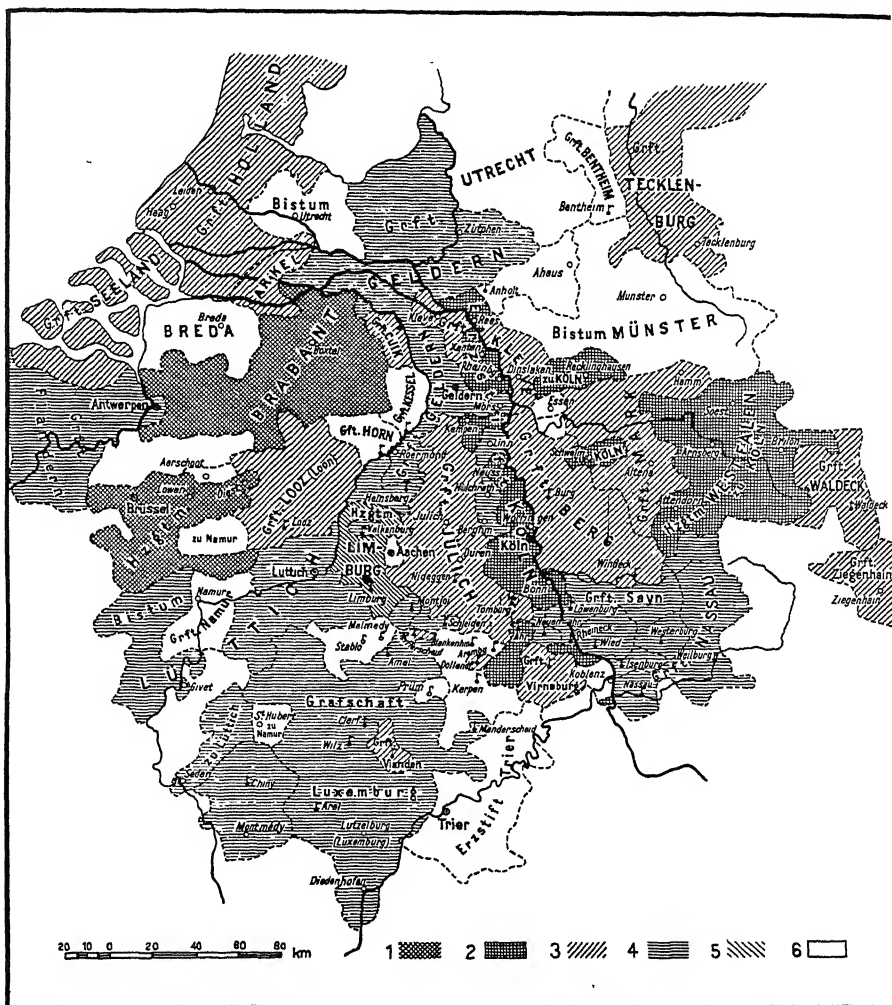


FIG. 69—TERRITORIES IN THE LOWER RHINELANDS IN THE 13TH CENTURY (from Aubin and Neissen) (scale, c. 1 : 3·5 m.)

1. Dukedom of Brabant
2. Archbishopric of Cologne
3. Allies of Duke of Limburg in the War of the Limburg Succession (1282-5)

GrF = Grafschaft = County
Bistum = Bishopric

4. Allies of the Archbishop of Cologne
5. Dukedom of Limburg
6. Neutral Territories

Hzgtn = Herzogtum = Dukedom

past and present political division, with the nuclei of the political divisions situated on the margins of the plateau, and the modern orientation of the northern sector to the Lower Rhinelands, and the southern sector (including the Moselle and Lahn valleys) to the Rhine-Main complex, reflect a persistent tendency for the life of the area to be integrated to peripheral areas in varied directions.

These latter assertions may be examined with special reference to the historic culture patterns on which the modern landscapes find their foundation—field, farm and village.

The southern limit of Lower Germany or *Niederdeutschland* was long placed on the southernmost ridges of the Rhine Massif, the Hunsrück and the Taunus. "In its political, moral, and ethnic conditions, the middle Rhine and its dependent lands to right and left are oriented rather to the Lower Rhine than to the Upper Rhine", wrote J. G. Kohl in 1852. The progress of cultural anthropology has greatly changed this naïve view. Linguistic researches have shown the intermediatè position of the Massif between culture spreads from the north and the south, as well as from the east and the west.

Dialectical differences reveal three breaks or barriers on the Massif. The so-called Hunsrück barrier curves sharply north on the east side of the Rhine. A second is the Eifel barrier, and a third the so-called Erft barrier. These three linguistic "breaks" run from southwest to northeast and converge on the Rothaargebirge, that stands out as a single and strong divide between a variety of culture associations to north and south. The sharp northeast course of the Hunsrück line on the east side of the Rhine is due to the penetration of Upper German influences from Hesse, while the northeast sector, beyond the Rothaargebirge, is within the Lower Saxon culture sphere. Owing to this recognition of the deep penetration northwards of culture associations from Oberdeutschland,

Fig. 69. To understand this map reference should be made first to the divisions that precede it, the *Gaue* (Fig. 54) and the bishoprics (Fig. 52). This area illustrates the extreme political disintegration of the German lands, but, at the same time, the permanence of these politico-cultural units that emerged in the Middle Ages and persisted until the early 19th century, when they served as the framework of the new divisions that were adopted on the new French model. Under the feudal regime, rights and responsibilities were divided between different lords from property to property, often within one village. During the later Middle Ages, such feudal rights were consolidated on a territorial basis (*dominium terrae*), for which purpose new districts were formed, with central points of defence and administration. These were the spheres of influence of small towns, many of which were founded for this specific purpose. Law and order were maintained in such an area by the representative of the lord. This local unit was the *Amt*. The larger unit (shown on the map) was the county (*Grafschaft*). Turning to the map, and ignoring the military allegiances shown, note carefully the major divisions: the bishoprics of Cologne (on the left bank of the Rhine) and Trier (with its axis along the Moselle); the outlier of the former in a permanent unit centred on Arnsberg; Jülich, Kleve, and Geldern; Berg and Mark; Luxembourg; and the many lesser *Grafschaften*. All are important as permanent politico-cultural units in the historical geography of these lands and in their areal associations of today.

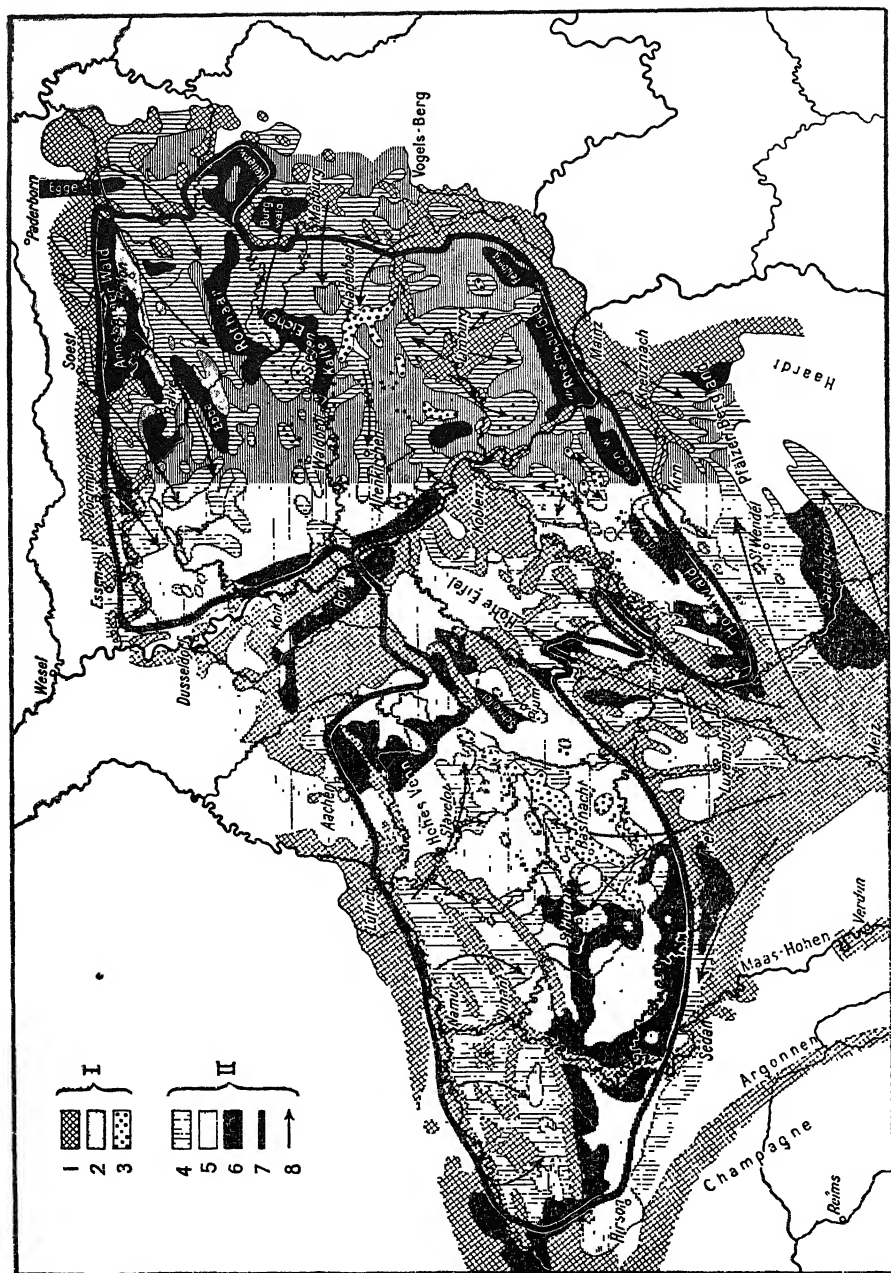


FIG. 70. THE SETTLEMENT OF THE RHINE PLATEAU (from Müller-Wille) (scale, 1 : 3 m.)

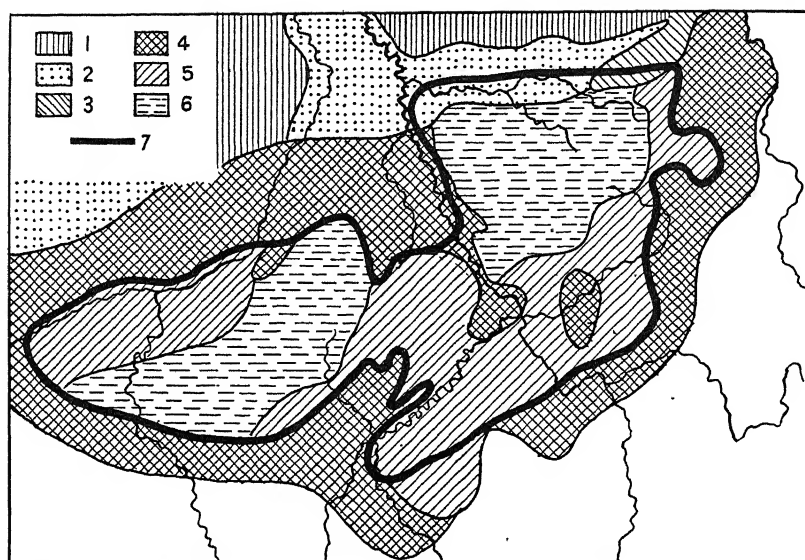
I. Old Settled Land. 1. New Stone Age. 2. Bronze-Early Iron Age. 3. Late Iron Age (from 600 B.C.).
 II. Cleared Land. 4. A.D. 500-800. 5. 850-1300. 6. Forest. 7. Boundary of the Rhine Plateau. 8. Directions of settlement in the early period of forest clearance (500-800).

the "Niederrheinisches Bergland" was gradually renamed the "Mittel-deutsches Bergland," a name that also more closely fits to the pattern of its drainage with respect to the master stream, the Rhine.

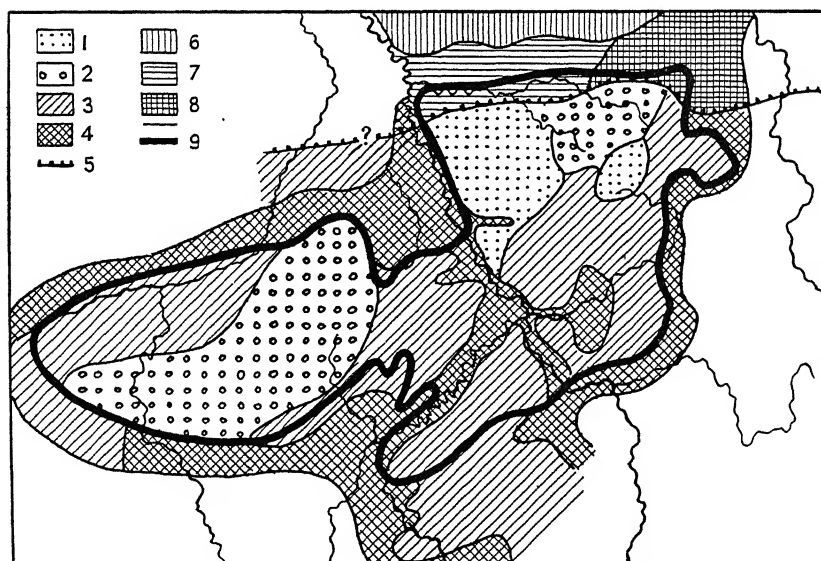
Romance influences have also penetrated from the west. Most important is the linguistic barrier that was established in the Dark Ages on the present French-German line. Western associations also brought practically the whole of the Massif, east to the barrier of the Rothaargebirge, into the area in which the law of divided inheritance prevailed (*Realerbteilung*), a fact that has had profound influence upon the development and character of economy and settlement. Politically, as we have seen, the Massif has been divided (Fig. 69). There is a division between a northerly group and a southerly group of political entities, separated by a clearly defined border zone, a thousand years old, along the southern boundary of the Prussian province of Westphalia and continued westwards through the province of Rhineland. The political boundary to the west crystallized after the end of the Middle Ages against France, the Spanish Netherlands and the United Provinces. The Rhine was in many respects a barrier. It was the eastern limit of the Napoleonic occupation. It has also served as an effective local divide of political groupings, and there were no bridges across the river until late in the nineteenth century.

The Massif is bounded by areas that were occupied by Neolithic man, and it may be assumed that, since the plateau was predominantly wooded, it was avoided (Fig. 70). Such was not the case, for there are several small areas of prehistoric settlement that were sheltered by higher land and contain soils on loess or limestones that are well drained, fertile and warm. Such were the valleys of the Sambre-Meuse, the Ruhr-Möhne, the Rhine and the Moselle; the small basins of Koblenz, Maifeld, Wittlich and Limburg; the limestone strips, ranging from northeast to southwest on the Eifel plateau, that link the Moselle valley with the Cologne bay; and the sheltered east-north-east to west-south-west valleys of the Sauerland. All these areas, except the last, were occupied by agricultural people in the Neolithic period, by people who pastured their flocks in the woods, felled trees, and cultivated summer barley and spelt. The spread of settlement from the end of the Iron Age onwards (500 B.C.) was probably associated with the introduction of both oats and rye, more hardy crops, whereas the other earlier cereals were adapted to warmer and drier conditions. In the early *Rodungszeit* (A.D. 500-850) large incursions were made into the wooded areas of the Massif. The extensions of the later medieval period took place in general higher areas with a more rigorous climate.

The subsistence economies that prevailed in the early nineteenth century were much the same as those that developed during the Middle Ages. The distribution of the various types of economy, that have been



(A)



(B)

FIG. 71—SETTLEMENT OF THE RHINE PLATEAU IN THE 18th CENTURY
(from Müller-Wille) (scale, 1 : 4 m.)

[Continued at foot of next page]

briefly summarized on pp. 128-32, is shown in Fig. 71A. The single-field system, that involved the continuous cultivation of rye, was characteristic of the Northern Lowland, and spread only into the Sauerland north of the Rothaargebirge. The *Feldgrassystem* was practised on the inner field in the higher and wetter areas, since oats, the only crop able to withstand the long cold winters, are exhausting and the land required frequent long fallows. On the other hand, arable farming, with compulsory communal cultivation of open fields, was dominant in the warmer and drier areas, where both winter and summer grains could be grown. This system, however, was in general only adopted in the inner field of the village community, and large areas of the outer field were periodically burned. In the lowland villages, however, the whole of the village area was drawn into the orbit of permanent cultivation (*Zelgensystem*).

The rural settlement forms are shown in Fig. 71B. Their distribution shows a remarkable general correspondence with the systems of rural economy. A dispersed habitat with compact or intermingled fields was the initial form of Germanic settlement in the fertile early-settled areas. A clustering of farmsteads and a consolidation of the cultivated land around such communities began to take place after the seventh century through the spread of the practice of equal subdivision of holdings and through the introduction of the practice of the communal cultivation of strips of ploughed land. Further, about 1200, ideas of urban living began to appear from the south and these added to the functions and size of the village community. The open-field or *Gewann* system with clustered settlements developed on the lowlands during the Middle Ages. In the lands where the climate was more severe, economy continued to be directed to stock rather than grain; grainland was often left in fallow and the large outfield was available for pasture, so that isolated farmsteads and small hamlets were still dominant there in 1800. This was true of the Sauerland and the Hoch Ardennes.

We turn now to the distribution of the types of farmstead. The main type is the half-timbered *Pfettendachhaus* described on p. 153. Only in

Fig. 71.

A. *Field Systems in the 18th century*

1. One-field system
2. 5-7-year grain rotation, then fallow
3. Field rotations
4. Common field system without an "outer field"

5. As 4, with an "outer field"

6. Temporary cultivation, reverting to rough grass (*Feldgrassystem*)
7. Boundary of the Rhine Massif

B. *Settlement Types*

1. Dispersed farmstead
2. Hamlet
3. Small village
4. Large village
5. Southern limit of the long-strip field system (*Langstreifenflur*)

6. The *Drubbel*

7. The compact *Drubbel*

8. Large nucleated *Drubbel*

9. Boundary of the Rhine Massif (For definition of *Drubbel*, see p. 134)

the northeastern sector of the Massif, beyond the barrier of the Rothaargebirge, does the Lower Saxon house appear. The *Pfettendachhaus* has two main variants, the Multiple House and the Unit House. The former, with buildings on two or more sides of an open yard, is found in the most productive farming areas. The Unit House is found elsewhere. The Lorraine house, for example, with its eaves parallel to the street, and with threshing-floor, stalls and living-quarters next to each other, and a low loft under a flattish roof, the whole built of stone, is an adaptation to the old mixed grain-growing and stock-raising economy that prevailed in Luxembourg, the eastern Eifel and the western Hunsrück. A variant occurs in the Westerwald and Bergisches Land. A type with a double storey, with living-quarters next to the stable and a large loft above approached by a ramp to a large gateway, is also adapted to the stock-raising economy in the rigorous climate of the high Eifel and Ardennes.

The Group Farmstead, with buildings arranged on two, three or four sides of a central yard is characteristic of more substantial mixed farming. The two-sided (L-shaped) arrangement is found in the drier uplands of the Massif—northeast Eifel, Taunus, and the eastern border of the Massif. The three-sided farm (*Torhof*) is dominant in the Pellenz and Maifeld, west of Koblenz, and in the Limburg lowland, both of them the most productive farmlands in the Massif. It is also dominant around the Massif in the Cologne bay and in Belgium north of the Meuse and the northern end of the Upper Rhine Plain, the Wetterau and the Hesse lowlands.

Thus, cultural influences penetrated the Massif from the Moselle valley, from the Hesse lowland to the southeast, and from the Lower Rhine. Within the Massif, climate has been a primary basic factor accounting for differentiations in the cultural geography. The initial settlement form, the isolated farmstead or the hamlet, is still characteristic of the Hoch Ardennes, the highlands of the Sauerland, and the Westerwald. Here the short growing season and heavy rainfall were not suited to the cultivation of grain and this impeded the general spread of the communal system of cultivation of contiguous field strips. In the middle-altitude plateaus, harder crops such as rye and oats could be cultivated and the primary *Einzelhof* was gradually displaced by the compact small village cluster. The low-level areas experienced the greatest transformation of their economies during the Middle Ages. Sheltered location, lower altitude, a fertile loessic or limestone soil, made possible the cultivation of wheat and even the vine. Here arable cultivation spread during the Middle Ages and the *Gewanndorf* remains the characteristic village type to this day.

The mining and smelting of ores were among the chief attractions of

the Rhine Plateau in the later Middle Ages. There is a pretty clear distinction between the lands to the east and west of the Rhine gorge. East of the Rhine, the early mining districts were the Lahn and Dill valleys, the valley of the Sieg, known in German as the Siegerland, and the southern portion of the Sauerland, which fell mainly into the historic dukedoms of Berg and Mark. The woods in these districts supplied timber for charcoal-smelting. At first mining and smelting were not carried on at fixed places, but moved about as local supplies of ores and timber were exhausted. When running water began to be used for power, the forges were located in the valleys, and in the later Middle Ages the southern Sauerland became the chief centre of mining, smelting and iron-working. But gradually the seats of the industry were shifted from the heads of the deep northward-flowing valleys to their lower courses where they approach the river Ruhr. On these newer sites, the plants were nearer to the main routes along the northern border of the Rhine Massif. There was also a shift from west to east that had other causes. In the west of the Sauerland, in the dukedom of Berg, the ores were early exhausted and mining spread to the east to the dukedom of Mark. The heavier iron-working industries tended to concentrate in the latter, whereas the finer industries that used less iron remained in the west. Later, the ores in the dukedom of Mark were insufficient in quantity, and supplies had to be imported from the Siegerland, which, with the Lahn and Dill valleys, had now become the chief seat of production. Even Swedish ores began to be imported. Skilled labour and fine iron-working, requiring small quantities of iron and depending on a body of skilled craftsmen, became the chief characteristic of this area.

Coal measures outcrop in the hills and valley slopes of the river Ruhr and dip gradually northwards. Though some coal was obtained here from surface and shallow workings, the whole of this area was still dominantly agricultural at the end of the eighteenth century. Coal-mining was stimulated by the iron-workings (not smelting) of the southern part of Berg as these changed over from charcoal to coal as a fuel. The coal was carried to the hammers and forges over short distances in small carts and on the backs of donkeys. Thus, the northward movement of iron-working received a further stimulus by this change, so that the iron-working plants gradually shifted to the Ruhr valley (Ch. 18). Charcoal, however, was still used for smelting, and the local iron ores, that lie in beds over the coal measures, were also mined in the same shaft. Steel works grew up using the "puddling process". The demand for coal increased, but north of the river Ruhr shafts had to be deeper and engineering difficulties arose. At first, it was scarcely possible to sink shafts deeper than about fifty metres, but later the steam engine permitted the pumping of water in shafts and the raising of the coal from greater

depths. The northward migration of coal-mining to what we now call the "Ruhr" was thus made possible.

While in the nineteenth century the iron-smelting and heavy engineering industries shifted northwards, first to the Ruhr river and then to the northward-sloping plateau between Duisburg and Dortmund, the iron-fabricating industries remained in the Mark and Berg districts of the Sauerland. They specialized in small metal-wares in the densely peopled countryside of the Berg land. Heavier iron and steel industries remained in the Mark land where the old hammer forges have been replaced by rolling mills that produce thin metal plates. Iron-mining in the Sauerland is now extinct, but it is still important in the uplands of the Sieg valley to the south and in the valleys of the Lahn and the Dill, although the reserves are small, and the ores costly to mine. The old smelting industry suffers from transport costs to and from the Ruhr.

West of the Rhine, iron-mining and smelting in the Hunsrück and Eifel go back to the Roman era and one can trace, on a smaller scale than east of the Rhine, a northward shift of these industries down the valleys of the Eifel, where they finally merged with the iron-working industries that developed on the coal-field around Aachen and the brass-working district around Stolberg. The latter is based on the occurrence of calamine which was first mined in Altenburg and then in Moresnet in the Eifel near the Belgian frontier. Copper ores were drawn from the Harz. The industry shifted to Stolberg from Aachen in the seventeenth century when new ores were found there, and it remains the chief German centre of this industry today.

THE RHINE GORGE (Fig. 115)

The Rhine gorge extends across the Massif from Bonn to Bingen, with the Koblenz basin in its centre. The gorge-like character is especially marked in the southern sector, where the valley slopes rise suddenly and steeply from the narrow valley floor to the plateau 250 metres above. Overhanging rocks and screes hem in the valley, downstream to St. Goar, and before the river was improved it was interrupted by rapids and rocky shallows. Where the gorge cuts through the quartzite ridge of the Taunus, it is over 350 metres deep. The river then cuts through the slates of the Hunsrück between Lorch and Oberwesel in a wider valley, where slopes are more gradual and the overhanging quartzite cliffs disappear. But then at the Lorelei the river again narrows to a width of 170 metres, and quartzite cliffs again confine the gorge, and the vineyards disappear, although orchards become more frequent on more gradual slopes. The high glacial and Pliocene terraces, about 150 metres above the river gorge, are covered with loam and loess soils. These ter-

race remnants are well developed on the north side of the gorge. Here are compact farming villages in the midst of open arable fields, while below in the valley, settlement is congested between the gorge slopes and the river bank. Scree covers the valley slopes below the lower edge of the upper terrace. The vine is grown on terraces where it catches the sun's rays, while the less steep slopes often carry cherry orchards. Small walled medieval towns, each a community of vintners, lie at the foot of the gorge, usually at the confluence of a small tributary, and the town spreads with a T-shape along the flat land. Such are Bacharach and Oberwesel. Here, too, are the ruins of many castles that were erected by warring and ambitious local lords as local defences for their strips of territory on the Rhine. Here they could derive wealth from duties paid by the rich vintners and from tolls on the traffic that plied up and down the river. Two roads, two main railways, and the great modern navigable highway, thread the gorge and pass by its villages and towns, which retain most of their historic character and are little affected by the changes of the modern era. Congested little towns, overlooked by the ruins of a castle, have houses built of stone with cellars for the storage of wine and implements. Also characteristic of these towns are narrow streets, and the absence of a large market place. September is the great time to visit these places at the time of the vine harvest. Wine is handed out free from great casks in the centre of the town and dancing and games with all and sundry take place in the open air. This was the pleasant routine of the tourist in happier days when passing through the Rhine gorge by boat. Indeed, tourism is an important supplementary source of income to the folk in these towns and villages (Pl. 22).

THE KOBLENZ BASIN

The Koblenz basin is a faulted depression in the heart of the Massif, in which the Rhine takes its course, temporarily quitting its gorge between Koblenz and Andernach, which are twenty kilometres apart. The edges of the plateau lie back from the river and enclose a platform about ten to twelve kilometres wide that is made up mainly of the upper and lower terraces. Much of its surface is covered with loess deposits. Maifeld and Pellenz are the regional names of this land. It is good farm land with orchards and market gardening. It is also a seat of industry, with its bases in the iron ores of the Siegerland and the volcanic rocks of the environs. The iron-smelting industry at the exit of the Sayn and Wied valleys, around Bendorf, originally used ores from the Westerwald. At the end of the eighteenth century ores began to be imported from outside, but the growth of the Ruhr virtually killed off the smelting industry, though the working of inferior local ores still

remains. The manufacture of building blocks is scattered over the whole basin in nearly four hundred plants and depends entirely on the local resources of pumice sand of recent volcanic origin that accumulated by wind action on the low terrace. Neuwied (20,000), situated on the low terrace and protected from river floods by a dike, was founded in 1653 for religious refugees. It has a rectilinear plan of wide streets, and was formerly a royal residence. It has attracted some local industries. Andernach (11,000) is a much older town with Roman origins, and since these days it has dispatched volcanic rocks from the Eifel by water.

Koblenz (52,000) is the capital of the basin. Situated at the confluence of the Moselle with the Rhine, it lies at a bridge point on the south side of the Moselle. It had its origin in a Roman castle called *Confluentes* on a slightly raised terrace remnant. Here, too, on the site of the Roman ground plan was later established the Frankish *Villa regia* with the stronghold in its northwestern corner commanding the river crossing. The plain, backed by the steep slopes of the wooded plateau, was occupied by the medieval town, except for the flat area at the confluence, the famous *Deutsches Eck*. The Altstadt was walled at the end of the thirteenth century. Around this (on its west and south sides) bastioned fortifications were built at the end of the seventeenth century. In the late eighteenth century (1780) the Elector of Trier erected a palace on the east side of the town facing the Rhine—the so-called Clementstadt—a fact that reveals the unimportance of the Rhine in the commercial development of the town. Under Prussian rule in the nineteenth century, the town became the capital of the Rheinprovinz and a strongly fortified fortress (1815–25), the walls of which were not demolished and replaced by boulevards until 1890. At this time its size was swollen by an influx of officials and soldiers. The town is today pre-eminently a centre for the Koblenz basin and its environs in the Vordereifel, the Lahn and Moselle valleys.

THE EIFEL AND ITS BORDERS

The Eifel is the northwestern section of the Rhine Massif. It is bounded by the deep valleys of the Moselle and the Rhine, and stretches west across the rolling plateau to the foot of the *Hohes Venn*, whose southerly continuation is the Belgian *Hautes Fagnes*. Here merge the Eifel and the Ardennes. The Hohes Venn is an extensive, undissected plateau, only 50–100 m. above the level of the surrounding lands, but, as the name indicates, its surface of impervious rocks and rigorous climate result in extensive tracts of bog; scrub of gorse and broom, cotton grass and berries; and forest. The Hohes Venn drops steeply to the north in several steps that are drained by the river Vesdre and several small tributaries of the Rur. The frontier follows the Sauer and Our valleys

in the south then runs north right across the Hohes Venn to reach the Dutch frontier on the north side between Verviers and Aachen.

A most important and distinctive feature of the Massif is a wide trough that lies between the high Venn and the high Eifel. It is bounded by heavy lines on Fig. 68. This trough is a rolling plateau of lower altitude (5-650 m.) that trends from southwest to northeast in the waist of the Massif between the Trier embayment and the similar small embayment in the north in the Rur-Urft valley.

The Schnee Eifel, a landscape outlier of the Hohes Venn, divides this broad trough into an eastern and a western section. The eastern section is drained south by the Kyll and north by the headstreams of the Ahr and the Erft. Bitburg and Zulpich command its south and north ends. It is geologically distinctive, for it has remnants of Bunter sandstones and mid-Devonian limestones, preserved in shallow synclines that are oriented from northeast to southwest in the trough. The Kyll river has cut deep gorges in the limestones at Gerollstein and both limestones and sandstones form fantastic residual hills in this valley. This sheltered zone, with relatively fertile soils on land of smooth relief and relatively easy of access, was occupied already in the New Stone Age and has since remained a zone of settlement and movement across the Massif from Trier to Cologne.

The western section of the trough is a high plateau of smooth relief, 500-600 metres high and some 30 kilometres in width, extending from northeast to southwest between the Schnee Eifel and the Hohes Venn. In the north it is drained northwards by the upper valleys of the Rur and its tributary, the Urft (on which lies a great storage reservoir). In the centre it is drained westwards by the upper valley of the Amblève into Belgian territory, and in the south by the south-flowing headstreams of the Our and Kyll into Luxembourg. The impervious slates and quartzites on this plateau floor yield a thin clay soil, but there are considerable areas of loam soil in the Rur-Urft drainage area in the north. The valleys are very deeply incised to depths of 200 metres. It has much scrub and forest, though cultivated land lies in clearings on the more fertile soils of the plateau. The main area of cultivation is around Monschau, on the southern side of the Hohes Venn. This area lies along the frontier. Its farming villages are large with 500 to 1,000 inhabitants, but in general hamlets and scattered farms are characteristic. This zone is continued to the southwest in the Oesling of Luxembourg. Here, deep valleys with oak woods, and fields of rye, potatoes and permanent pasture, also stand in marked contrast to the forest and bog lands of the higher plateau to the north.

Most of this frontier area of 1,000 sq. km., together with the Eupen district north of the Hohes Venn, was handed to Belgium after World

War I. The *Kreise* of Malmédy to the south is 70 per cent German and 30 per cent Walloon (French) in speech, the latter lying along the former Belgian frontier. Economically, the area is isolated, but has been most closely associated with the Aachen complex through the connection of the Venn railway. This railway was passed entirely to Belgium, in such a way that several small patches of land on its west side below Monschau belong to Germany, but the station of Monschau is Belgian, while the town itself is German.

The Hohe Eifel lacks undissected surfaces. It is cut by a dendritic network of valleys and its surface is surmounted by the ruins of Tertiary lavas (Hohe Acht, 748 metres). This dissected relief is used by the motor racecourse of the Neuburgring. The Ahr valley and its tributaries to the north cut into the plateau to form a distinct relief unit. It is bordered on its northern side by the deeply dissected Ahrgebirge, a relief unit that is comparable with the Hohe Eifel. The upper course of the Ahr valley is wide, flat, and covered with meadows. Downstream, it merges into deeply entrenched meanders where vineyards clothe the more gentle slopes. The valley broadens out widely and is clothed by orchards and cultivated fields that are often overlooked by steep-sided basalt hills. Its compact villages have place-name suffixes such as *heim* and *ingen* that reveal the early settlement of the valley by the Germans.

The Voreifel to the south has an undissected surface, with an average altitude of 500 metres, though it is cut by the deep incisions of streams, that lie parallel to each other and flow south to join the Moselle. These short valleys are deep, steep-sided and wooded, and are avoided by house and road. On the main level plateau, with an altitude of 500–530 metres, there are many explosion craters (*Maare*), and masses of scoria with cauldron-shaped craters, from which lava flowed into the deep surrounding valleys. These volcanic cones, fifty-five in number, stretch in a northwest–southeast direction at the southwest end of the Hohe Eifel between Daun and Hillesheim, across the north–south depression of the Hocheifel. Seven of the *Maare* contain lakes of which the Meerfelder *Maare* is the largest. There is a second volcanic area at the eastern end of the Hohe Eifel between Andernach and Mayen. This lies around the Laacher See and has forty crater hills, though *Maare* are absent. Volcanic tuffs are found on both sides of the Nette valley, and the conical volcanic hills, clothed in deciduous woods, stand in marked contrast to the dry porous tuff land. The volcano of the Laacher See emitted lavas that filled the surrounding valleys. These lavas near Mayen have been quarried from early days. The stone-cutting of Mayen reaches back to prehistoric times and the basalt quarries yield mill-stones, building-stones and gravels. Volcanic tuffs and pumice stone are quarried in the Pellenz for buildings of all kinds (Pl. 21).

The Bitburg land is a southern continuation of the trough and runs southeastwards from Zülpich. It is a scarped landscape, developed on Bunter sandstone, Muschelkalk, and Lias clay and sands, and forms a northeastern projection of the Trier embayment. Undulating surfaces predominate, and merge in the north into the 500-metre-high surface of the Massif. The sandstones are well wooded on the outer rim as are the Lias sandstones along the Sauer valley. Between the Prüm and Kyll valleys lies arable country at the heart of the land with large nucleated villages (*Gewanndörfer*). This is the heart of the Bitburg Land, and its focal town, Bitburg, was originally a Roman settlement on the Roman road from Trier to Cologne.

The peripheral areas of the Eifel Plateau were more early and intensively settled than the higher plateau. There are evidences of prehistoric settlement and routeways on the north-south trough north from Bitburg. The smooth relief of this zone, the relatively low altitude of 5-600 metres, and its sheltered location, lying in the lee of the Hohes Venn, and the fact that it lay along a main Roman and medieval routeway from Trier to Cologne, all account for the deep infiltration of settlement into this area from Roman times onwards. Medieval monasteries were established here, castles were erected, and many village clearings established in the Middle Ages. In subsequent centuries the middle Devonian limestones and the Bunter sandstones, that are preserved in the shallow northeast-southwest synclines, afforded supplies of iron, zinc and lead that were used in local industries in the small towns. The Celtic settlers spread from the loess areas in the southeast into the heart of the plateau. The Romans then covered the Eifel with a net of military roads on which there were trading settlements. Minerals were mined, and water was carried by a viaduct for nearly eighty kilometres from Urftal to Cologne. The Roman road ran from Trier northwards to Cologne and Bonn. A second main route ran from Koblenz westwards across the Hohe Eifel around the northern end of the Hohes Venn. A network of minor roads ran from the Moselle northwestwards into the Voreifel. In the Middle Ages the main routes ran from the Rhine to the west, and northwest from Koblenz across the Voreifel and the Wittlich depression to Trier, and from Cologne around the northern border of the Massif through Düren and Aachen to Flanders. Other roads ran northwest from the Moselle route. These then were the main arteries on which developed the chief towns. The Maifeld, at the eastern end of the Voreifel, the old Mayen *Gau* of the seventh and eighth centuries, was one of the first areas of German settlement. Place-name suffixes such as *heim*, *ingen*, *lar* and *mar* belong to this period and are contrasted to villages with name suffixes such as *nich* and *nig* of Celtic origin. The famous romanesque abbey of Maria Laach, dating from the end of the eleventh century, was a centre

of settlement in the Middle Ages and speaks of the flourishing condition of human culture in the Eifel in this period. Other areas of early German settlement were the Zülpich area and the depression along the Trier-Cologne route.

Settlement in the Eifel Plateau, on the other hand, took place mainly by forest clearance in the Middle Ages. This is shown by such place-name suffixes as *scheid*, *seifen*, *bach*, *rath*, *weiler* and *rode*. The monasteries were particularly active in this process, beginning their labours in the ninth century (Prüm, Malmedy, Echternach). The suffix *hausen* apparently marks the end of the period about 1250. In the later Middle Ages the territory was very divided politically and to this reason is to be ascribed the large number of small, fortified and often planned towns, situated adjacent to castles. These serve today as local market and administrative centres (e.g. Daun, Gerollstein, Münstereifel).

Economic stagnation affected the area from the end of the Middle Ages. Agriculture in the Eifel is still dominated by the communal practices of the three-field system. Large areas are held in common by the Gemeinde and a part is cultivated each year and divided between the peasants. The grass and scrub are cut, dried and burned, and the ashes spread over the land. This is then sown with rye in the first year, the second year with potatoes, and the third year with oats; thereafter it is left idle for ten years or more and is overgrown with heath and scrub. This is the method known as *Hauberge* and is responsible for the aspect of much of the Massif.

Iron- and lead-mining were pursued in the Eifel, especially in the Ahr valley, in the Middle Ages. In the district of Gemund in the upper Rur valley, 350,000 cwt. of iron ore were mined in 1821 and the industry employed a thousand persons; but this occupation has now disappeared. The Prussian state in the nineteenth century planted coniferous trees in place of the destroyed forests and these plantations are a conspicuous feature of the countryside today. The state also encouraged the consolidation of the small scattered holdings and introduced new farming methods. Only in face of strong local opposition did officials of the state effect some consolidation of minute holdings in the villages, where often one property consisted of well over a hundred minute strips in the arable land (p. 124). The area is so poor that men have emigrated to the Ruhr and the Aachen area since the 'seventies. The early industries have gone, the iron forges of its valleys are gone, the iron- and lead-workers of the Ahr valley are gone, and the old lead mines south of Aachen are almost defunct. On the other hand, the scenery and warm mineral springs have become attractive to tourists. The towns on the northern border of the Hohes Venn and the Eifel have become the main modern industrial centres. This area is discussed in the following chapter (pp. 473-4).

THE MOSELLE VALLEY

The winding, deep meanders of this river afford a greater variety of scenery than appears in the Rhine gorge. The valley was used by an important medieval routeway that led southwest to Trier and beyond, but today the railway uses the easier gradients of the adjacent Wittlich depression and the river is useless for navigation. The valley has the same clustering of villages and castles as the Rhine gorge, but, unlike the latter, it is not followed by the main avenues of modern trade.

Upstream from Koblenz to Cochem the valley is narrow like the Rhine gorge. Beyond the railway tunnel (4,200 metres) at Cochem, there begins a series of deep, sinuous meanders cut into the plateau. High, narrow ridges lie in the neck of the meanders, or isolated hills have been formed by the shift of the meanders. Cultivated land is distributed among the forested slopes according to slope and exposure. Vineyards lie on steep and often rocky slopes facing the sun on the concave side of the meanders, where the land rises steeply over 300 metres, and at the exits of tributary valleys. Coppice (*niederwald*) occupies shady, steep slopes. Treeless arable land lies on the broad terraces in the meander bends, and arable fields and fruit trees occupy the gentle convex slopes. The settlements are strung out and congested at the foot of the concave cliffs and the river bank, or spread with a triangular shape on the deltaic cones of the tributary streams, or spread out more widely, though still nucleated, on the gentle convex slopes. Above Schweich, where the Wittlich depression begins, the valley widens on the east flank of the Trier bay where the Kyll, Sauer and Saar valleys converge. The Wittlich depression is a long narrow lowland on the north side of the deep meandering valley of the Moselle between Schweich and Bullay-Alf. Between the two an isolated, deeply dissected, portion of the plateau forms a narrow ridge called the Moselberge. The Wittlich lowland is a faulted trough filled with red sandstones that have been eroded by the Moselle and its tributaries. It is in effect the real divide between the Eifel and the Hunsrück.

Trier (63,000) was a vast Roman settlement known as *Colonia Augusta Treverorum*. Its area of 285 hectares filled the whole width of the valley floor. After the Franks had destroyed it several times, it became a cultural capital under the Carolingian emperors. It then became a small, bishop's town, and its cathedral was the nucleus of the medieval settlement. The market place was established outside the cathedral immunity about 1000 by the bishops. The medieval town expanded between it and the river. It was walled about 1300, and lay well within the Roman walls. Some of its greatest Roman monuments remain, such as the

Porta Nigra, the imperial baths, and the basilica. Church and nobility dominated its life from 1500 to 1800. It was much damaged and rebuilt under the French occupation after 1794 and became the head of a Department. After 1815 it was under Prussian rule. It is today a market and administrative centre, with some small industries, such as leather-working and tobacco-making. In particular, it has been the centre of the wine industry, since Roman times, for the villages in the middle and upper Moselle, Saar and Sauer valleys.

The Eifel and the Hunsrück canalized human circulation in large measure into the Moselle valley lowland. Trade in Roman, as in medieval, times was centred on Trier. Here, too, was the seat of the archbishop, the chief territorial as well as ecclesiastical power, whose control reached not merely down the Moselle valley, but also across the Rhine to the Lahn valley and on to the Eifel corridor (Prüm). There is here a unity of human occupation, clearly developed within a persistent political framework, that is centred on the Moselle valley and focused on the historic capital city of Trier.

THE BERGISCHES LAND

This section of the Massif lies north of the Lahn. It is divided roughly by the Sieg valley into the Bergisches Land and Sauerland to the north, and the Westerwald to the south.

Bergisches Land lies between the Ruhr and the Sieg valleys and rises eastwards from the Rhine to the Rothaargebirge. The high or chief terrace on the western border is 140 m. high in the south, falling to 80 m. in the north along the Ruhr. Above it rises the Massif with a closely dissected surface with an average altitude of 200 to 250 m. Then follows a higher level to the east about 350 m. high, and further east there is evidence of a higher level at 450 m. The land is roughly limited to the east by the boundary of the province of Rheinland, which in turn follows the old boundary of the dukedom of Berg. It has varied rocks that include impervious schists and clay shales (*Schiefertone*), sandstones, graywackes and pervious limestones. These rock outcrops have a general northeast to southwest strike and through differential erosion give rise to a good deal of local variety of relief and differences in soil productivity and in the density of settlement. The country is predominantly a hilly or dissected plateau, but Karst features appear in the limestone areas. Deeply cut valleys notch the plateau, decreasing in depth and steepness of slopes in their upper courses, their headstreams rising on the smooth and often marshy surface of the plateau. Such valleys often offer difficulties to communication as is evidenced by the overhead line that runs over the

town of Elberfeld-Barmen in a deep narrow valley in which the bulk of the built-up area of the urban complex is concentrated; and by long bridge spans, such as the Mungsten railway bridge, the highest (107 m.) in Germany (Fig. 64, p. 415).

The occurrence of scattered, small deposits of iron ore, coupled with the presence of timber and running water, early attracted iron-mining and smelting activities, and this was encouraged by the stimulus of the small territorial rulers of this country. The rivers offered power for hammer forges and water for storage dams, and today they provide sites for great water-storage reservoirs, like that of the Möhne dam. Iron-working had its chief beginnings in the dukedom of Berg and in the seventeenth century the merchants spread iron-working eastwards into the Grafschaft of Mark. Today there is a marked contrast between the two districts, in that the district of Berg is concerned with iron and steel making, and the district of Mark with fabricating industries. These activities are still carried on in small workshops and even as domestic occupations. Knives and razor blades are important products of Solingen (133,000) and its neighbours, scissors and small tools of Remscheid (92,000). Mettmann (12,500) and Lenne (absorbed by Remscheid) produce small iron and steel goods. Metal-working industries are also carried on in Lüdenscheid (50,000), Iserlohn (42,000), Altena (16,000), Menden (14,000). Their products include nails, wire, needles, and pens. Schwerte makes nickel goods and Lüdenscheid aluminium goods. Elberfeld-Barmen and Hagen are the chief urban centres.

Elberfeld and *Barmen* are combined in brick and mortar as well as administration to form the single complex of Wuppertal (400/326), so named after the valley in which they are situated. The Wupper attracted the first yarn-bleaching mills in the sixteenth century and in the seventeenth century *Barmer Artikel* were world-wide exports. The twin town, shaped like a dumb-bell, spreads along the congested valley floor and is bordered by the wooded slopes of the valley and the adjacent smooth-surfaced plateau. Barmen is still the textile-making town, specializing in such goods as lace and artificial silks, while in addition to weaving and cloth-making, Elberfeld has more varied industries.

Hagen (151/126) lies in the deep valley floor among wooded hills at the end of the Ennepe valley, a northeasterly continuation of the Wuppertal. The settlement clustered around the *Hof* of the Cologne church at the confluence of the Volme and Ennepe streams, but industry did not appear till after the Thirty Years' War and town law was not acquired till 1746. It is thus a recent urban growth. Since the advent of the railway it has become an important industrial centre, thanks to its command of the routeway south to the Sauerland and the Bergisches land and its nearness to the Ruhr coal-field. In 1929, through the absorption of two

neighbouring communes, its population reached 148,000. It has light engineering and textile industries, and makes accumulators and has some heavy engineering industries. It is thus economically a link between the Berg-Mark industrial area and the Ruhr.

THE SAUERLAND

The Sauerland or Süderland embraces the drainage basins of the upper Ruhr and Lenne between the Ebbegebirge and the Rothaargebirge. This is a high-lying plateau that lies, for the most part, inside the province of Westphalia. Its low, rounded ridges are covered with beech and pine woods, and the plateau is seamed by deep and unexpected gorges, in which there are over twenty dams. Its settlements are small, and the houses have steep, slate-covered, roofs. It is bounded to the south by the Rothaargebirge, to the north by the Haarstrang, to the west by the Volme valley and to the east by the Waldeck Upland. Its relief is determined by a series of eastnortheast to westsouthwest synclines and anticlines. The belt from Iserlohn, Arnsberg and Brilon contains considerable limestone (Karst) areas, as in the area around Brilon. The longitudinal depressions contain forest clearings that are followed by routeways. Old Saxon strongholds controlled these routeways, though they fell to the Franks at the end of the eighth century. This same eastward spread is evidenced in the early expansion of the archbishopric of Cologne that held territory until the nineteenth century. The bishopric of Arnsberg, the centre of the district, was long held by the archbishops of Cologne. South of this lower zone beyond Iserlohn lies the higher plateau of the Sauerland, reaching some 500–650 m. Here it was that the mining of silver, lead, copper, tin and iron took place, using timber as charcoal and the running water for power. The Ebbegebirge (663 m.) is a thickly wooded north-east-southwest barrier, south of which lies another trough (Attendorn-Elspen-Brilon), beyond which, to the south, is the Rothaargebirge. This massif is a main divide between north and south. To the north spread the Saxons and the political influence of the archbishops of Cologne, with their focal point at Arnsberg. This was offset by the formation of the Grafschaft of Mark, which during the Reformation became Protestant. In 1815 the two areas became the *Regierungsbezirk* of Arnsberg in the new province of Westphalia. The old metal-working industries disappeared during the nineteenth century, as industries shifted to the coal-fields, and today the area is agricultural with a low density of population, though iron-working industries are still carried on in Hagen, Schwelm, Iserlohn and Lüdenscheid.

THE ROTHARGEIRGE

This highland area is popularly associated with the Sauerland. Rising above its surroundings, it reaches heights of 700 to 800 metres. It slopes gradually to the southeast where it is drained by the Lahn and the Eder, but drops steeply to the north and west where it overlooks the Sieg and the Lenne valleys, which together form a narrow trough occupied by the railway from Hagen to Siegen and the road along the southwest to northeast course of the Lenne. It is bordered by the platform of Brilon to the north, beyond the east-west trough of the Ruhr, and by the platform of Waldeck to the east. This block has a lower peneplain surface level of about 600 metres above which rise the higher ranges, reaching 750 metres (Kahlen Asten, 842 metres) and 800 metres in the extreme east (Waldecker Upland). The Rothaargebirge is one of the richest forest areas of Germany. It is thickly forested on both the plateau and in the valleys, except for the heath-covered Asten, and it supplies the Ruhr with pit-props and supports a domestic woodworking industry. On the other hand, the heavy rainfall and long cold winters are not suitable for crop-growing. Scattered patches of cultivated land and loose village clusters, with low slate-roofed houses built of half-timber, reach as far as the foot of the Alt-Astenberg at 770 metres. In addition to stock-raising, the village folk derive a livelihood from the summer tourist trade and winter sports. The chief centre of the latter is Winterberg. The Rothaargebirge, however, has always been a commercial, cultural and dialectical divide. It was penetrated late, and not very intensively, by the Saxons from the northeast, by the Franks from the Sieg and Dill valleys, and by the Hessians along the Lahn valley. Timber used to be carted from the highland from the upper Eder valley to the Siegländ, and iron ore was carried from the latter to the smelteries in the upper Lahn valley. Trade and crafts grew then only in the valleys on its periphery and the latter were mainly based on its ores and timber. The main settlement was in the Dill valley where Dillenburg, established in 1240 as a castle town, became the capital of the dukes of Nassau in the sixteenth century. Herborn, its partner town in the valley, developed as a market town on the main thoroughfare across the Westerwald.

THE SIEGERLAND

The basin of the upper Sieg river is framed by the high lands of the Ebbegebirge to the north, the Rothaargebirge to the east, and the Hoher Westerwald to the south. It is a deeply dissected upland, with average summit levels of 450 metres. As elsewhere in the Massif, it is wooded,

with much coppice and bush, and a frequent sprinkling of meadow and cultivated land. Its wealth in iron and zinc and lead ores, however, has given to it a distinctive economic character. Mining commenced in the fourteenth century when twenty-five smelteries are recorded. Timber, ore and running water were the bases of the industry. The communal cutting of the forest trees for temporary cultivation (*Haubergwirtschaft*) supplied the charcoal for the smelting of the iron ore, while the oak tanning fed a leather industry. The iron industry has decayed since the mid-nineteenth century and the leather industry has declined in the last fifty years.

The Siegerland is Germany's chief domestic source of iron ores, although these are nearing exhaustion; it is estimated that the reserves will last for about one generation. The shafts reach 1,000 metres in depth and the ore must be heated by costly processes to raise its metal content to 60 per cent before dispatching it to the Ruhr. Here, again, it suffers from high transport costs by rail to the Rhine bridge-head. The mining industry could not withstand these physical difficulties if it were not for a State subsidy. The smelting industry has been supported by cheap freight rates on imported coke from the Ruhr. The iron-smelting industry suffers similar difficulties. Production of ores in 1861 of 100,000 tons jumped to 350,000 in a few years, but in the inter-war years it averaged about 200,000 tons. The advent of the railway in 1861 caused an increase in production. The competition of the Ruhr has almost killed the industry, though a revival was brought about by the Nazis in the 'thirties by encouraging the maximum production of domestic supplies. The nucleus of this area is the cluster of industrial settlements in the valleys of the Fern and Sieg, where small urban settlements contain furnaces, rolling mills, foundries and engineering works. The chief cluster is in the so-called *Hüttental* between Weidenau (11,000) and Siegen (33,000). Overlooking the valleys are the denuded forests, now in coppice and bush, which have been cut for timber over large areas for many centuries. However, much of this has been reforested with spruce. Agriculture is subsidiary to industry and scarcely a village is purely rural.

THE WESTERWALD

The Westerwald is traditionally defined by the Rhine, the Lahn, the Dill and the Sieg valleys. It is a regional name without any past or present political significance. It has a distinctive physical character that depends primarily on the occurrence of Tertiary deposits that mark it off from the surrounding highlands. These deposits are of Upper Pliocene date. At their base are fluvial and lake deposits. These are followed by Upper Miocene tuffs, 60-100 metres thick. The eruptives of the

Siebengebirge belong to the oldest of the Tertiary volcanic periods, whereas the volcanic tuffs of the Westerwald are more recent. On the latter lie lignite formations with a maximum thickness of 70 metres. On these again, and in the border areas lying directly on the Devonian strata, there are many layers of mid-Miocene basalts that flowed out radially from the Hoher Westerwald. Pliocene weathering produced pockets of bauxite and iron ore, and from the more recent Tertiary deposits are derived the brown-coal clays (*Braunkohlentone*).

The country of the Westerwald falls into two parts, the Unterwesterwald and the Oberwesterwald. The *Oberwesterwald* is the higher part of the plateau and includes both the Paleozoic outcrops and the basalt plateau. Its ill-defined borders, to the south towards the Limburg basin, are marked by residual outliers of basaltic hills on a Tertiary base. Its border is about 450 metres high, its highest points 650–660 metres. It has a smooth relief with broad, shallow valleys and gently sloping intervening hills. Impervious weathered loams which are inclined to be peaty and acid cover the rolling plateaus and shallow valleys. Many shallow lakes and ponds have been formed by damming the streams for fishing. The basalt plateau drops steeply to the north and east, but to the south it merges into the (Tertiary) basin of Limburg by outlying residual basaltic hills, such as the Dornburg (396 metres).

The basaltic Oberwesterwald is markedly distinct from the normal features of the Massif. Grass and stock-raising (*Trieschwirtschaft*) are far more important than arable farming, and the severe climate permits the growth of potatoes and oats only. Basalt rocks appear widespread in the meadows. Beeches and pines are grown around the villages as shelter belts from wind and snow. Meadows are dominant in the valleys. Forests occur only on the margins of the areas on the heights above the Nistertal. In the interior, there are many small patches of woodland in generally open country, and in the highest area of all between Marienberg and Driedorf, open treeless, arable country extends up to the summits of the ridges.

The *Unterwesterwald* lies between the higher Oberwesterwald and the Lahn valley to the south and the dissected zone along the Rhine gorge to the west. It is a low plateau with an altitude of 300 to 320 metres (corresponding to the *Trogfläche*), into which are cut short valleys drained westwards to the Rhine. The chief of these is the Wied. Basaltic hills give to it a distinctive character. Above the plateau to the south rises the Montabaur Hohe (546 metres), a forested quartzite ridge. The whole of this area falls into the Unterwesterwald, centred on Montabaur, in the south; and the so-called Vorderwesterwald, which is drained by the Wied and is centred on Altenkirchen, in the north. About half of this latter area is wooded, though there are patches of arable and meadow land.

There were early iron and lead workings here, and there is some basalt-quarrying today for which Linz near the Rhine is the centre. The capital of the *Kreis* is Altenkirchen, a very early ecclesiastical settlement, from which much of the medieval forest clearance took place. The Siebengebirge is a group of residual volcanic hills that lie in between the Sieg and the Rhine. These conical-shaped hills reach heights of 400 metres and rise from a level platform with a height of 200 metres (Drachenfels, 461 metres, Petersburg). Settlement was not effected here until about 900 A.D. by monastery and castle in forest clearings. A good third is still forested. Stone-quarrying, which began at an early date, is still a chief occupation. Orchards and vineyards, villages and tourist homes characterize the slopes near the Rhine. Siegburg on the Sieg river was formerly a seat of cloth-making and leather-working, but it suffered during the French wars at the end of the seventeenth century and has not since recovered its former importance.

The early settlement of the Westerwald is revealed by the frequency of place-name suffixes such as *ingen*, the Romanesque architecture of its churches, and the clearance of the forest that took place both before and during the *Rodungszeit*. It was crossed by important highways in the Middle Ages and its fortified churches and congested villages, entered by small entrances from the main roads, bear evidence of the medieval need for defence. Small castle towns grew up on its through roads. They border the Oberwesterwald—Herborn and Dillenburg in the Dill valley to the east, Montabaur and Hachenburg to the west. The high density of rural population stands in contrast to the natural poverty of the area. Some settlements actually reach heights of 600 metres and a hundred years ago the Hoher Westerwald was overpeopled. In the Unterwesterwald the houses are built of pumice stone, a practice that spread from the Koblenz basin, but in the basalt land of the Oberwesterwald there are two-storied half-timbered houses of the Frankish type (*Ernhaus*) with slate or thatched roof. The large number of people led to the development of crafts, such as woodworking, and industry developed particularly on the margins of the country through contact with the Koblenz basin and the Siegerland. Brown coal has been exploited since the sixteenth century. Stone is quarried in the Siebengebirge and on the border of the basalt plateau of the Hoher Westerwald. Iron ores are mined in the Dill valley and are partly smelted here. Clay beds in the Unterwesterwald form the basis of the ceramics industry that is long-established and of considerable importance. It survived the Thirty Years' War and flourished with the introduction of the making of the Renaissance drinking-vessels. The centre of this "jug and pot-making land" (*Krug und Kannerbäckerlandes*) is Montabaur and a dozen other places nearby. The small ovens and the piles of firewood and of finished

earthenwares in many villages reveal one of the chief activities of this countryside, which is carried on in the home and in the workshop, and accounts for the unusually high density of population in such an area.

THE HUNSRÜCK

This highland block is roughly quadrangular in shape with sides marked by the Moselle, the Rhine and the Nahe valleys. It finds its continuation east of the Rhine in the Taunus. Both the Hunsrück and the Taunus are the same in general character and form the southernmost members of the Rhine Massif, dropping steeply to the south to the Saar-Nahe Uplands (Pfälzer Bergland) and to the Upper Rhine Plain respectively. Residual quartzite uplands cover considerable areas in the western sector and these are covered with full-grown forests of beech and spruce. These forested uplands are the Soonwald, Idarwald and Errwald, and have altitudes of 600 to 800 metres. Each highland block contains several parallel quartzite ridges with intervening broad valleys. In contrast to these smooth-surfaced areas are the many deeply cut valleys on their edges that drain north to the Moselle and south to the Nahe. The slope to the north is gradual. To the south a peneplain, cutting across Devonian and Permian beds, intervenes between the quartzite ridges and the Nahe valley. The latter is eroded in soft red sandstones though the river is constricted by hard porphyries and cuts through the quartzites in a gorge in its lower course. North of the quartzite ridges, the great triangular block between Moselle and Rhine is 400 to 500 metres high and is a smooth peneplain developed on schists. This is the area for which the name Hunsrück is popularly used. Owing to its accessibility, the Hunsrück was traversed by Roman roads, the chief of which used the present course of the Hunsrücklängsbahn. The centre is the small town of Simmern (3,000) where Roman roads converged. This town commands a through route via a tributary valley to the Nahe across the Hunsrück between the Idarwald and Soonwald to the south.

The high Hunsrück, unlike the Taunus, has always been a barrier to human intercourse, though it can easily be circumvented by the Moselle and Nahe valleys. The name is popularly confined to the northern plateau and it is the high wooded quartzite range that forms the barrier. The northern plateau was an old German *Gau* in the early Middle Ages, and became an independent dukedom (Pfalz Simmern) among the scattered political territories in the late Middle Ages and after. The present *Kreis* of Simmern, that roughly corresponds with it, remains to this day an island of Protestantism in a Catholic area. The short, deeply cut tributaries of the Rhine sever the area from contact to the east and its closer historic connections have been with the middle Moselle and Trier. On

the other hand, the southern slopes are more closely allied with the Nahe valley. The Hunsrück is isolated and backward. The settlement stems from the Frankish occupation. The group farmstead dominates, and half-timber structures characterize its villages. Local slates are used as roof material and as a protection for the walls, especially on the sides exposed to wind and rain. Particularly in the higher forest the farm lands are excessively subdivided (through the practice of divided inheritance). Compulsory communal cultivation is still practised and extensive oak woods are held as communal property and cut for their tannin. This area thus shelters a survival of the unproductive *Hackwaldwirtschaft*.

THE TAUNUS

The whole plateau block east of the Rhine and between the Lahn and the southern edge of the Massif is called the Taunus. The quartzite ridges of the Soonwald are continued eastwards in the Höhe or High Taunus from Rudesheim on the Rhine to Bad Nauheim, a distance of 70 km. The steep southern edge borders the Upper Rhine Plain. In the west, the Höhe drops steeply to the gravel-covered terraces of a narrow foreland, while, in the east of the Höhe, highland and plain interdigitate through the uneven resistance of the rocks and the northward penetration of faults associated with the Rhine Rift. Faulted horst blocks of pre-Devonian schists and gneisses push southwards into the loess-covered strip of the lower Main plain, while outliers of the plain penetrate northwards in tectonic depressions in which lie the towns of Hornau, Homburg and Ostheim.

The main range of the Höhe breaks into two separate ranges, separated by hollows eroded in soft phyllites. Differential erosion results in marked inversions of relief, for the highest ranges (such as Altkönig, 798 metres, and Gr. Feldberg, 880 metres) correspond to synclinal depressions. The smooth relief is broken occasionally by a few deep transverse clefts. The high plateau is rugged, however, in comparison with the extensive rolling surfaces that slope gradually northwards to the Lahn valley. These peneplained surfaces extend over clay states in the west, and over limestones, sandstones, schists and diabases in the Lahn basin to the east. In the middle and east of the Taunus, faults across the grain of the structural trend result in a more varied relief. Thus, the Feldberg and the Pferdskopf (668 metres) is a faulted quartzite ridge that is bounded on both sides by faulted troughs, the Idstein trough to the west, which cuts right across the range, and the Using trough to the east, which affords a through route via the Using valley to the Wetterau to the south.

The drainage patterns, which have a northwest to southeast direction in the Lahn and its tributaries, and also in the Rhine and other valleys

parallel to the Höhe, reflect these structural trends.' The valleys that cut across the Taunus cut up the Pferdskopf block into a rugged dissected plateau. But smooth plateau surfaces prevail generally, though these are interrupted by deep and narrow gorges. Some of these valleys, such as the Wispertal, are cut to depths of over two hundred metres.

The southern slopes of the High Taunus, facing the warm south, are closely cultivated and densely settled. Here are mineral springs that account for a number of health resorts such as Wiesbaden and Homburg. Vineyards and orchards, strawberry-growing, and chestnut groves, clothe the lower hill slopes and the whole zone is closely allied in its settlement and human relations with the middle Rhine complex, with its capital in Frankfurt. On the other hand, above this cultivated zone, the highland is forested right to the highest summits. These highlands originally were covered with deciduous forest, but pine plantations have appeared since the end of the seventeenth century. The beech, however, is still dominant. The fact that full-grown forest covers only about 40 per cent of the whole area is due to the clearance of the forest which was particularly active in the Middle Ages from 1100 to 1400 and extended the upper limit of settlement to above the 600-metre contour line. From early times the Taunus was sought as a refuge by settlers from the prehistoric settled lands of the Rhine and Lahn valleys, and in it are to be found earthworks belonging to the Neolithic, Iron Age and Early German periods. The Roman wall known as the *Limes* crossed the western Taunus and the highland was also crossed by pre-Roman roads at several points. The Idstein trough, the chief of these passes, was settled as early as the Carolingian period. The majority of the settlements, however, date from the later Middle Ages and are indicated by the suffixes *rod*, *hain* and *scheid*. A number of castles and associated settlements also came into being at this time, as revealed by the frequency of place-name suffixes of *berg*, *stein*, *fels* and *eck*. Most of the many castle towns were founded in the fourteenth century, though some have subsequently lost their medieval town law.

Large, compact farming villages lie in the upper Aar, Idstein and Using troughs, but the deep valleys are forested and thinly settled, except for mills on the trout streams and the abandoned castles on rocky isolated slopes. The three-field system is retained and meadow is subordinate to arable land. Only in the area between the Rhine, Lahn and Aar, and in the *Goldener Grund* of the Idstein trough, and in the northeast of the Taunus, does stock-farming assume greater importance. Holdings are generally small. Wheat is grown in the lower basins, but in the high Taunus potatoes are dominant. The people of the Feldberg were so poverty-stricken in the early eighteenth century that the lord introduced nail-making as a domestic craft, and for this purpose master craftsmen

were brought in from the highly reputed nail-making district of Schmalkalden in the Thüringer Wald. Industry today, however, is insignificant. There is still a little leather-making, using local oak tannin, but the small iron forges have long since disappeared. Orientation towards the Mainz-Frankfurt complex dominates the economy. Three railways cross the ranges and of these the Idstein line is the chief. This same route is followed by the historic Hohen Strasse and the new Autobahn from Cologne to Frankfurt.

THE LIMBURG BASIN

The drainage area of the middle Lahn has its focus in the old town of Limburg. Its relations, both physical and human, are more close with the Taunus than with the Westerwald. The basin has considerable physical diversity, in spite of its being part of the drainage basin of the Lahn. The Lahn valley was an important medieval routeway for the Rhine at Koblenz to the Hessian Corridor at Giessen. The river has deeply cut meanders and the railway that follows the valley from Giessen to Niederlahnstein has twenty tunnels. Castles perched on high cliffs overlook the river. The eastern entrance to this incised valley is commanded by the small industrial town of Wetzlar (16,500). This town is dominated by the hill-top site of its great Romanesque church. Its industries are engineering and optical instruments. The deep, narrow valley begins below Wetzlar, near Weilburg, a town that is situated on a high river spur. The bishop's town of Limburg (11,500) is the capital of the area. It is the centre of a fertile loess-covered area, early settled, and today dominantly in wheat cultivation. Limburg is dominated by its great Romanesque cathedral, which lies on a steep-sided limestone spur overlooking the river, as at Wetzlar. Mineral springs account for the growth of Bad Ems and other places during the eighteenth century. Local iron ores still feed a few furnaces. In the lower valley lead and silver ores are still mined, while in the upper course of the valley, between Diez and Wetzlar, limestone and marble are quarried.

THE EASTERN BORDER OF THE MASSIF

This border area lies between the Dill and the Diemel rivers between the Westerwald-Rothaargebirge and the Hessian Trough to the east. It is bordered by the north-south courses of the Eder and Lahn valleys. It is drained eastwards by the Eder, on whose incised course, just before quitting the Massif, the reservoir of the Waldecker Talsperre is situated. The area is a peneplain, 400 to 500 metres high, developed on Trias to Devonian strata, and is clearly marked off from the high Rothaargebirge

by a clear break of slope marked by a line joining Biedenkopf-Hallenberg-Diemelsperre. This is the Waldeck Upland. South of the Lahn, the platform is more dissected and merges more gradually westwards to the Westerwald. Quartzite ridges and schist basins give to the country an alternating arrangement of ridge and vale. The Kellerwald is broken up by faults and is deeply eroded. It is overlooked by the quartzite ridge of the Wustergarten (673 metres). This whole area is thinly settled and has a backward economy, with densities of population generally under 60 to the square kilometre.

CHAPTER 18

THE LOWER RHINELANDS

GENERAL (Sheet 5, Fig. 72)

THE Lower Rhineland or the Rhineland-Westphalian Lowland is that section of the North German Lowland that lies north of the Rhine Plateau in the northwestern sector of Germany. It is bounded to the west by the Holland-Belgium frontier, that lies parallel to the east bank of the river Meuse. The whole area is traversed from southeast to northwest by the Rhine, which receives no important tributary on its left bank between it and the Meuse, and receives the Ruhr, the Emscher, and the Lippe on its east bank. Further to the east, the Westphalian Lowland is drained northwards by the Ems, but the geographical relations between the lowlands nearer the Rhine and the Westphalian Lowland are so close that the eastern boundary of the Lower Rhineland may be placed in the Teutoburger Wald.

The natural terrain types are shown in Fig. 72. Study of this map will reveal that they all belong to types 1, 2, 3, 4 and 5. These are river plains, sand and gravel platforms of heath and bog, cultivated plains of heavy loams and clays, and loess plains. The geographical units into which these terrain areas are grouped may be called the Lower Rhine Plain, the Cologne Lowland, the Aachen Industrial District, the Westphalian Lowland, and the Ruhr Industrial District. Politically, it contained before 1800 the small dukedoms of Cleve to the west of the Rhine, the archbishopric of Cologne in the centre on the west bank of the Rhine, and the bishopric of Münster east of the Rhine (Fig. 69). Out of these units the two Prussian provinces of Rhineland and Westphalia were formed in the early nineteenth century. The boundary between the two ran parallel to the Rhine some thirty kilometres to the east of it. This Rhineland-Westphalia boundary now cuts right through the Ruhr urban area.

This whole area of the Lower Rhineland owes its unity not merely to its common historical development and its persistent political framework, but also to the great influence exerted by the Ruhr on its modern economies, to the interdependence of its industrial sections, and to the leadership of Cologne and Düsseldorf. Figs. 73 and 78 show the agricultural areas in the new *Land* of North Rhine-Westphalia.

THE LOWER RHINE PLAIN AND COLOGNE BAY

This is a plain in which the present land forms are due mainly to the erosion of a vast fan of alluvial deposits that was built up by the ancestors of the Rhine and Meuse to a depth of nearly 400 metres. Widespread beds of gravels and sands are capped by interglacial deltaic sands and clays, into which the rivers have cut their beds. This extensive terraced landscape is shaped like a fan with its handle in the Cologne bay upstream to Koblenz, the terraces being formed in steps that decrease in altitude and broaden out northwards. In the south, recent faulting has produced a series of narrow horst blocks that alternate with flat and often marshy valley floors.¹ The deltaic deposits fall into three main terrace levels. (Fig. 74). The upper terrace (*Hauptterrasse*) is the highest of these terraces and is formed of the oldest of the alluvial gravels (Terrain Type 4). Its soils are sandy, dry and forest-covered. A projection of this terrace extends northwards as a horst (Viersen Horst), rising 80 metres above the surrounding land, that separates the drainage of the Rhine and Meuse. The middle terrace (*Mittelterrasse*) lies at several levels and is mostly devoted to agriculture. The low terrace (*Niederterrasse*) is only a few metres above the level of the Rhine flood plain but it is the area with the closest settlement and contains both towns and close rural settlement. The Ice Age has left its mark in a belt of wooded morainic hills on the low terrace, that are a continuation of the Hilversum-Nijmegen moraines of Holland. Such are the hills at Kleve (106 metres), Calkar and Xanten, that end southwest of Mörs in the Hülser Berg (65 metres).

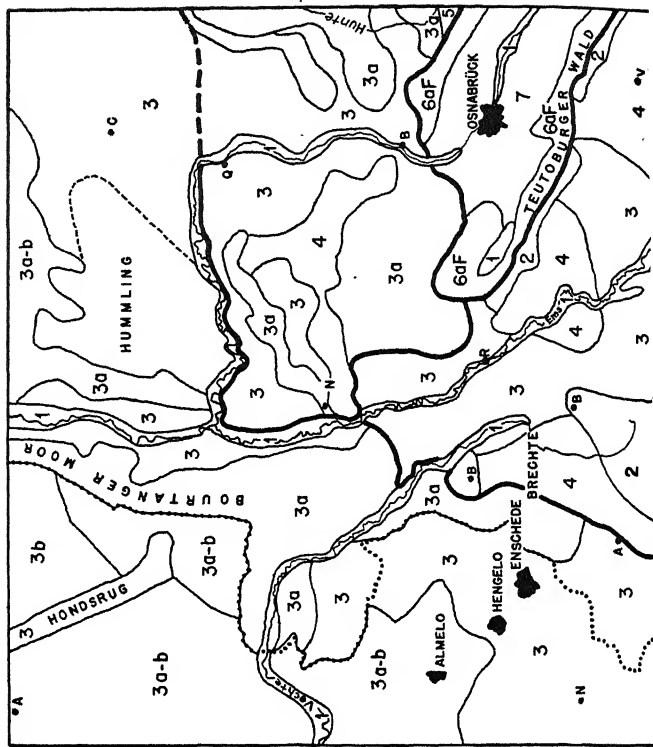
The terraced landforms on either side of the Rhine are not symmetrical. On the west side, all three terraces are represented and are covered in part with loam and loess, as in the Zülpich and Jülich *Börde* on the border of the Eifel, that have all the landscape features of the loessic areas to the east. On the east side, wind-blown sand deposits are also extensive, and account for the wide extent of woods, bog and heath, as north of Düsseldorf in the Golzheim Heath, and the woods and heaths around Sterkrade, Dinslaken and Dorsten, which have only recently been settled by the sinking of shafts to the buried coal measures on the northern edge of the Ruhr field. Only the lower terrace is approximately symmetrical on both sides of the Rhine and has approximately the same width on both banks. It is low lying and contains stretches of marsh and shallow water, that mark the former flood courses of the Rhine. An example of this country is the Moerser (or Mörser) Land, described on p. 411.

The Rhine itself crosses the southern half of the Cologne bay in a fixed

* ¹ The horsts are Viersen, Brugge, Geldern, Ville, Rur-Erft; and alternating valleys are Rur, Swist, middle Erft, Niers and in part, the Rhine itself.

Sheet 5 covers a part of the Northern Lowland in the north, most of the Münster Lowland east to the Teutoburger Wald, the West Weser (or Osnabrück) Upland; the Lower Rhine Plain; Cologne Lowland; the Hellweg Loess Zone; the Ruhr and Aachen Industrial Districts; and the northern portion of the Rhine Massif east of the Rhine (Sauerland).

1. *Alluvial Plain*: Clay soils. Meadow and coppice.
2. *Flat or Undulating Land*: Clay or Loam soils. Grass and/or arable, woods. Mixed open arable and hedged fields. Villages and dispersed farms. Numerous copses.
3. *Low Plateau of Sand and Gravel* (35–80 m.): *Sandy Geest* (Heath). Low hills, often closely undulating reach 100–150 m. Little surface water. Heath extensive pine plantations, oak-birch woods, frequently interrupted by areas of low-lying bog (3a below). *Esch* village and dispersed farms (*Kampensiedlung*).
- 3a. *Low Plateau (under 35–40 m.)*: *Sand and Gravel*: *Bog or Fen*. Water-table near surface, peat with sphagnum moss and cotton grass (*Hochmoor* or bog). At lower levels, swamp and shallow lakes with sedge mosses (*Flachmoor* or fen).
- 3b. *Low Plateau of Sand and Gravel*: *Reclaimed Bog*. Peat cuttings. Farms strung along roads and canals (*Fehnkolonien*).
4. *Low Plateau of Sand and Gravel*: *Forest, Scrub, Heath*: *Dry*.
5. *Undulating Arable Land on Loess-Loams*. Few streams. Compact villages.
- 5a. As 5, with more marked relief and some well-defined meadow-filled valleys.
6. *Undulating Limestone Uplands*: *Loams*: *Mainly Arable*. Meadows and orchards in valleys, compact villages.



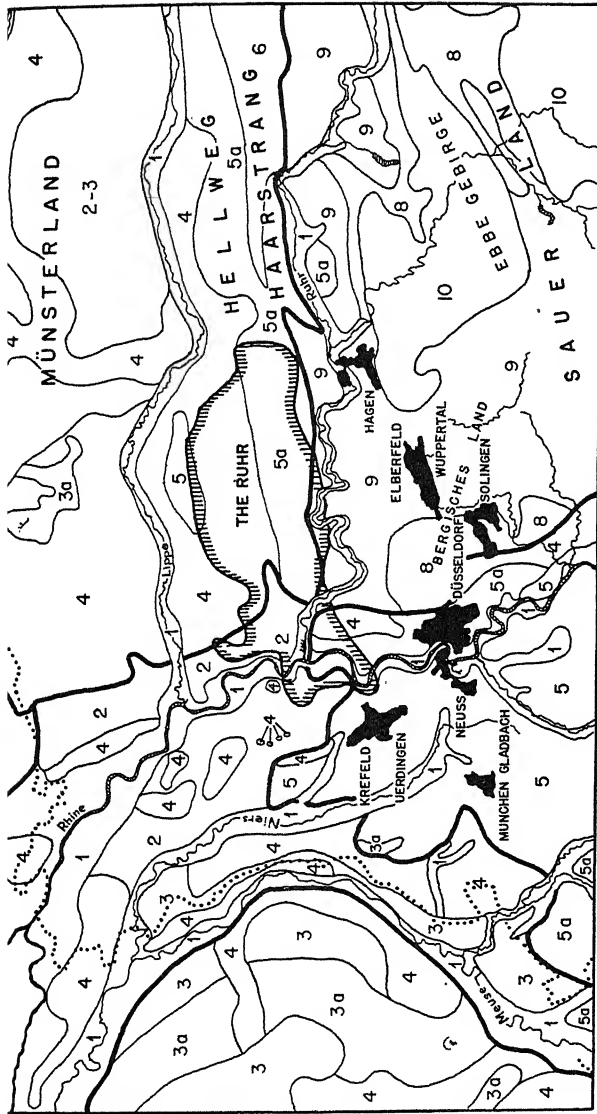


FIG. 72—TERRAINS AND REGIONS: Sheet 5. NORTH-WEST GERMANY
(scale, 1 : 1,250,000)

- 6a. *F. Limestone Ridges: Forested.*
 8. *Rhine Plateau: Undulating: Cultivated: Loams, often on limestone, volcanics, or loess. 70% arable and grass, little woodland.*
 9. *Rhine Plateau: Undulating: Low Altitude (250-500 m.): Thin clays. Deep V-shaped valleys with slopes over 15°. Much coppice (Niederwald) and cultivated clearings.*
 10. *Rhine Plateau: Middle Altitude (500-1,000 m.): Undulating, few deep valleys and gorges. Bog, scrub, and forest.*
 13. *Urban Terrain.* Urban areas indicated around cities with over 100,000 inhabitants. Partially urban area of the Saar is indicated by a hatched border.

Note. The heavy lines are the boundaries of the major physical units (Fig. 13).

bed bordered by bluffs. North of Cologne the bluffs gradually disappear, and the flood plain becomes wider and contains abandoned river meanders and cut-offs. The river has often shifted its course in this flood plain in such a way that in Roman times Neuss and Xanten were both actually situated on the river-bank. Through a shift in the river, Neuss was replaced by Düsseldorf as the river crossing. Till 1703 Rheinberg, now two kilometres from the river, was situated on its bank. Since the fourteenth century dikes and canals have been extended and improved, and the river-bed has been dredged since the middle of the nineteenth century. The main river is now dredged, straightened and embanked within its former flood plain.

In the whole of these lower Rhinelands, from Bonn to the Dutch frontier, there is a distinction between the lower-lying lands in which the flat river plains cover a large area, and the southern section, centred on Cologne, in which much of the land is blanketed by deposits of loess. It is this latter fact, as well as a higher altitude and better-drained, undulating relief, that gives distinctive character to the terrains of the Cologne bay (Fig. 72, Terrain 5). The following paragraphs pertain to the Lower Rhine Plain proper. The boundary between it and the Cologne bay is indistinct, but is most definitely fixed by the northern limit of the loess deposits.

THE LOWER RHINE PLAIN

Below the confluence of the Lippe, the Rhine plain is in effect an extension of the Dutch polder land. The river embankments, with a width of 400 metres, rise above the river plain, which at Xanten is about eight kilometres wide, and on the Dutch frontier twenty-five kilometres. This plain is marked by water meadows and rough pastures, with scrub, marsh or shallow water, or alder bush in the course of the flood channels. The extensive Lower Terrace stretches west beyond the Niers to the Meuse and is crossed by many stretches of bog and marshy meadow in the course of old flood channels of the river.

Isolated farmsteads dot the meadow lands of the extensive alluvial plains, both in the flat polders, where they are irregularly distributed in the fields, and behind the dikes where they are arranged in linear series. The isolated farmstead also predominates in the arable land of the loam-covered platform of the Kempen area, west of Krefeld. The farmstead is a T-shaped variant of the Saxon unit house and is built of brick. The same building material is found in the towns. The towns attained their status in the first half of the thirteenth century, and are sited on the edge of the terraces. The only flourishing towns today are those which enjoy the double advantage of rail transport and direct contact with the stream of Rhine traffic, such as Emmerich (13,500), Wesel (24,000) and Kleve

(23,000), the last being connected with the Rhine by a canal. Many of the smaller towns are simply small market centres, with no industry, so that they have preserved their historical character.

The hills that are preserved as residual sectors of the higher terrace

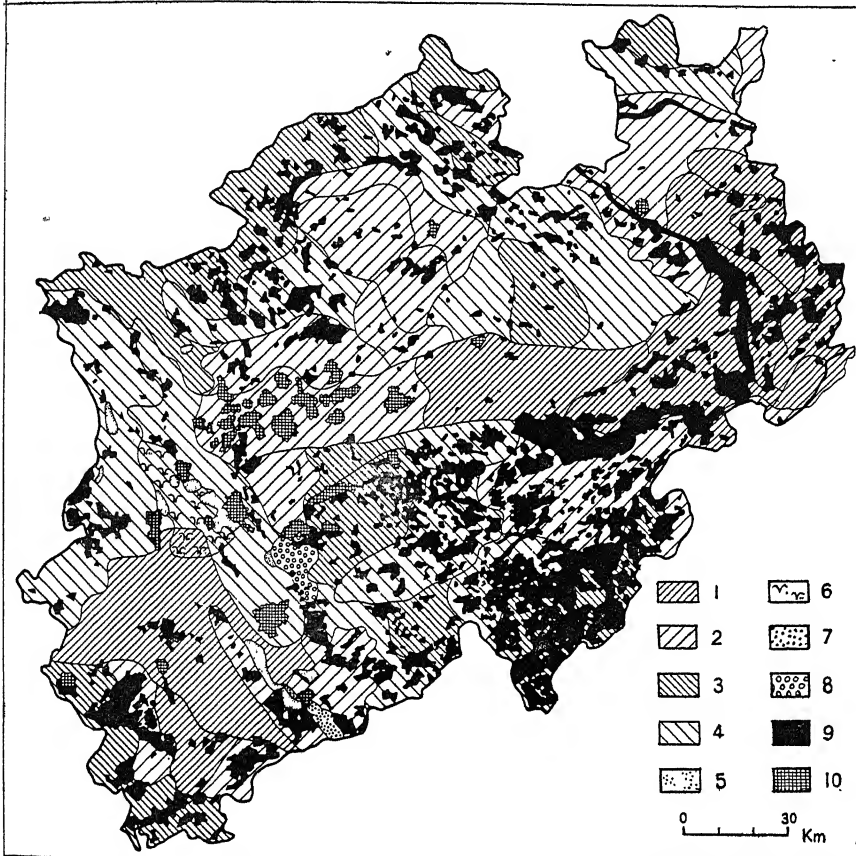


FIG. 73—LAND NORTH RHINE WESTPHALIA AGRICULTURAL ZONES (from same source as Fig. 78) (scale, 1 : 2 m.)

1. Areas with over 50% of agricultural area under cereals
2. Dominantly under cereals (35–50%)
3. Over 50% under meadow and rough pasture
4. Dominantly fodder crops (40–50% of agricultural area)

- 5 and 6. Market gardening
7. Market gardening and orchards of the Rhine Gorge
8. Orchard land of the Bergisches Land
9. Forest
10. Urban areas. Fine lines are boundaries of the agricultural zones

and of the glacial moraines are favoured as sites of urban settlements, especially, at points where they are undercut by the Rhine. These sharply raised sites are favoured by small historic towns that lie on the

routes or around castles on hill-tops. The main Roman road ran from Cologne through Xanten and Kleve to Nijmegen.

The towns along the lower Rhine reached their urban rank in the thirteenth century, though several had Roman origins. Kleve has its nucleus in a castle on the steep morainic hill 106 metres high (*Oberstadt*), while on the slopes of the hill down to the Rhine front lies the lower town (*Unterstadt*). It was a ducal residence, and today has margarine and boot industries. Emmerich lies on the edge of the lower terrace, three metres above the river alluvium. It became a riverside port in the thirteenth century through a shift in the course of the river, where it developed as a river port on the Dutch frontier, emerging during the nineteenth century as a toll and break of bulk station. Xanten was a Roman river crossing, situated on the Roman highway parallel to the Rhine, but it lost its economic importance with the shift of the course of the Rhine. Its medieval nucleus was the cathedral immunity outside of which grew the small medieval market town. Wesel was at a crossing of the Rhine, sited on the lower Lippe, but the change of the river course of the Rhine in the eighteenth century left it inside the confluence of the river with the Rhine. In 1680 it was fortified by Vauban with a great citadel on its southern side as one of the chain of fortresses that protected the eastern frontiers of France. This fact, together with another shift in the course of the Rhine, hindered its growth. Its inner fortification was demolished in the 'nineties and the outer girdle in 1921. Though small, it has grown by virtue of its nearness to the coal-field, the opening of the Lippe canal in 1930, and by the bridging of the Rhine in 1917.

THE COLOGNE LOWLAND (OR BAY)

The northern border of the Rhine Plateau forms a V-shaped lowland that is traversed from its apex at Bonn northwards to the frontier by the Rhine. The only break in the smooth relief of this lowland is the northwest to southeast narrow plateau-ridge of the Ville or Vorgebirge, a section of the high terrace that forms a raised horst about 100-130 metres above the plain. (Fig. 68, p. 430.) This ridge has a base of clays and sands (Lower Miocene) upon which lie lignite deposits up to 100 metres thick, that in turn are covered with diluvial gravels. It is bounded on its western side by a steep fault scarp, beyond which lies the northwest to southeast trough of the Erft valley. The fault scarp on the eastern side has been eroded and the slopes are more gradual. The whole of this Ville ridge is disfigured by great lignite quarries.

The Ville divides the lowland into two sectors, the Cologne-Bonn embayment to the east and the Düren-Euskirchen embayment to the west. The former is a rich farm land, developed on loess-loam soils,

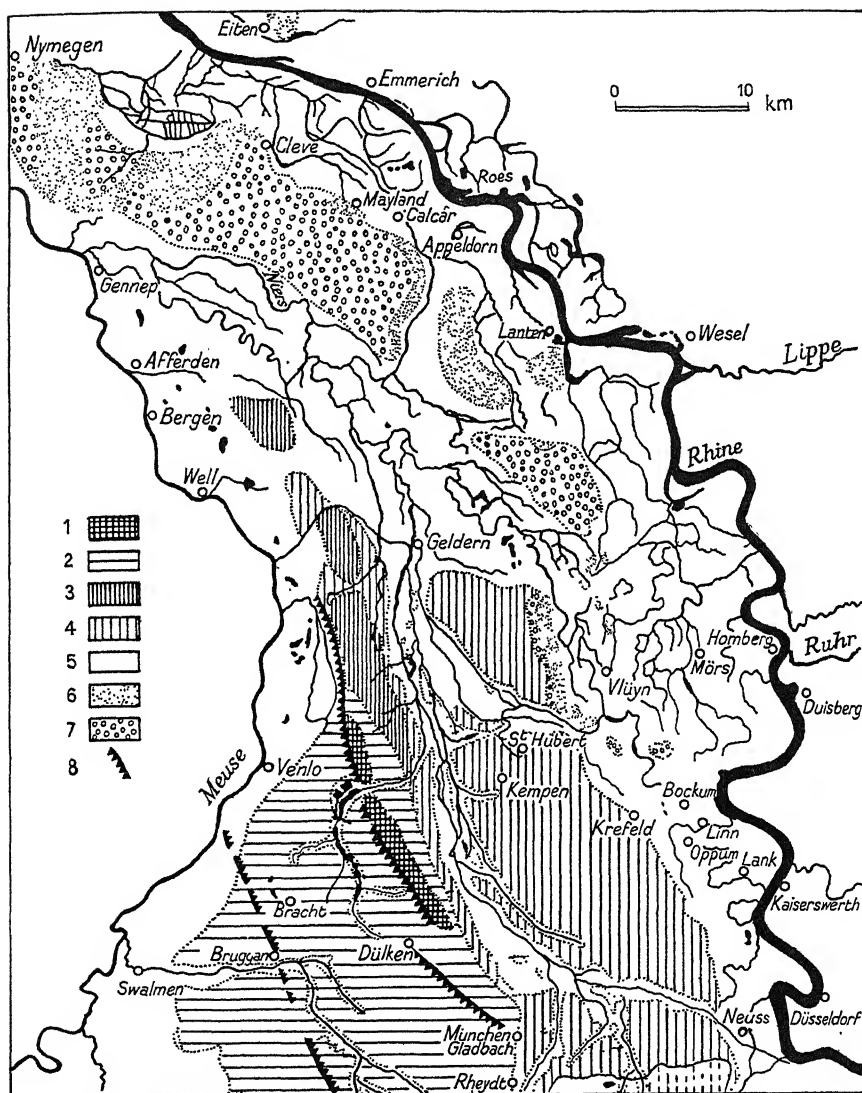


FIG. 74—LAND FORMS OF THE LOWER RHINELANDS (from Haushofer) (scale, 1 : 600,000)

1. High terrace
2. Principal terrace
3. Middle terrace
4. Low terrace

5. Low terrace alluvium
6. Morainic hills
7. Glacial terraces
8. Faults

with a landscape of hedgeless fields and compact villages, and a crop rotation based on wheat and beet. It is dominated by Cologne. The western bay is a faulted trough, covered here and there with thick beds of gravels (Pliocene) of the ancestral Rhine. Post-Tertiary faults diversify its terraced relief with low scarps. The settlements follow the scarps and the valleys. The valleys follow the directions of the fault troughs from south to north—the Rur and Swist-Erft. These valleys are shallow but clear-cut and are occupied by strips of meadow and woods. Above the terrace levels rises the Eifel gravel plain at the foot of the Rhine Plateau, which was built by streams issuing from the Eifel. This plain is continued eastwards in the upper terrace of the Rhine at the southern end of the Ville.

The Rhine washes past the last remnants of the Rhine Massif some ten kilometres above Bonn, and on reaching this town the hills of the high terrace recede back from the river which then enters the Lower Rhine Plain. Until the nineteenth century the plain was devoted to corn. The lower slopes of the high terrace, the Vorgebirge, covered with loess, were devoted to vineyards and orchards, with compact villages in their midst, frequently clustered around a ruined castle. The high terrace itself, covered with old diluvial gravels, is still forested, though formerly it also had much heath (the name Venusberg at Bonn is derived from Venn, meaning bog and heath). From the site of the old bastion known as the Alten Zoll in Bonn, which overlooks the river at a point where it steeply undercuts the edge of the low terrace, one has a magnificent view upstream to the volcanic conical hills of the Siebengebirge, while downstream the river winds to the horizon across the plain. This fertile area was known as far back as Frankish times as the Bonngau, for Bonn was its focus.

Bonn (99/95). The great north-south highway on the west side of the Rhine follows its left bank. There never has been, however, an important east-west route, for Bonn lies at the head of the Cologne bay and the great east-west route from Flanders to central Germany is commanded by Cologne. Thus, Bonn had no bridge across the Rhine until the construction of the footbridge in 1898, although it always had an active ferry service across the river. The Rhine was in many respects an effective human divide. Though the traditional focus of the Bonngau, the town of Bonn was never an important seat of long-distance trade. Its traditional special role has been that of a fortress. The Roman camp was sited to the south of the medieval town. In the early Middle Ages it became a fortified residence of the wealthy archbishops of Cologne. It was around this nucleus, between it and the river, that the medieval town grew. It was walled and received town law in 1243. It became one of the strongest fortresses in west Germany during the wars of Louis XIV,

when it was destroyed in 1689. But in 1713 its fortifications were in part demolished and it ceased to be a fortress. In the eighteenth century it became a residence of the *Kurfürsten* of Cologne and a political and cultural centre. A residence, gardens, and *allée*, were added to the old town. In the early nineteenth century, lying in the new Prussian province of Rhineland, its university was established (1818) and occupied the buildings of the royal residence. The city then grew as a seat of learning, as a tourist centre, and as a pleasurable place of residence for the retired. The advent of the railway in the 'forties and growth after 1870 occasioned the expansion of the area beyond its old zone of fortifications and the gradual transformation of the *Altstadt*, although it still retains many of its historic buildings from the seventeenth century. Today, Bonn is an important university, residential and tourist centre, and has little industry, the ceramic industry being localized across the river in the small town of Beuel (17,000). Though war damage was serious, it has revived, as the capital city of the new republic.

The bay below Bonn is dominated by *Cologne* (768/491). The outstanding advantages of this site for the growth of a great city are the convergence in the bay of great overland routes, its position on the Rhine at a point where the river, though about 600 metres wide, could be more easily approached and crossed than elsewhere, and the fact that it lies in the centre of a fertile lowland. Cologne has always been a left-bank city, although the Romans erected the small castrum at Deutz in order to command the river crossing. All the principle routes radiated to the west and south and up and down the Rhine parallel to it, whereas the uplands to the east offered a barrier to routeways (Fig. 27, pp. 158, 159).

The city suffered appalling damage from aerial bombardment. The greater part of the old core is laid flat. Three-quarters of its buildings were destroyed or damaged. And yet, in the midst of the rubble, stands the cathedral, and normal commercial life is carried on in improvised buildings. Three-quarters of the population of Cologne lives on the west side of the river, the business and residential area, with miscellaneous and mainly light industries (except for recent industrial development to the north), whereas the heavy engineering industries and working class residential areas lie on the east bank. Recent developments include the chemical plant at Leverkusen (50,000) to the north.

For the growth of Cologne, refer to Fig. 75. The core is the *Altstadt*. This has a semi-circular shape, and was formed in stages in the Middle Ages from (a) the Roman settlement, covering 100 hectares, on the lower terrace; (b) the shipping and mercantile quarter (*mercatus coloniae*) on the river front next to the Roman settlement, which appeared in the tenth century as the *Rhein Vorstadt*; (c) the medieval extensions clustered mainly around churches; (d) later extensions. The whole of this settlement

was walled between 1180 and 1260. Against this wall, the new Prussian fortifications were erected in the 1820's, when the city was selected as a western fortress in the newly established Rhineland province on the Rhine. In the 1880's, the semi-circular fortifications were replaced by the main boulevard called the *Ring*. Cologne reached its peak of greatness at the height of the Middle Ages, when it had an area of 4 sq. km. inside its walls and a population of 50,000. It was a great commercial centre and had a famous university. In later centuries it declined in commercial importance, through the competition of cities in the Low Countries and England, and the ravages of the Thirty Years War, so that it was quite an inconsiderable town when it fell to the French in 1794, and then to Prussia in 1815. In the next hundred years it grew to importance again as a commercial centre and a fortress. The new fortifications of 1820, built on the site of the old medieval walls, separated the Altstadt from the new semi-circular belt of the Neustadt, which was built in the 'eighties in a semi-circular zone 500 metres wide. This was also encircled by the railway tracks. Then, in the 'eighties, a new zone of fortifications, again built as a semi-circle, bordered the Neustadt, and, as in Paris, Vienna and other cities, permanent building was forbidden on the immediate outskirts of the fortifications. These fortifications were demolished between 1907 and 1911, and their place taken by a green belt 1,000 metres wide. Outside the latter grew the new suburbs, which were absorbed by Cologne in 1889 and again enclosed by the outermost ring of individual forts in 1912. Its role as a fortress, however, came to an end in 1919.

The Altstadt became more and more the seat of business, though it was still densely populated, with narrow streets, old buildings and many historic monuments. The chief of these is the great Gothic cathedral, adjacent to which is the railway terminal, from which the railway lines cross the river by the Hohenzollern bridge. Congestion was relieved by the absorption of surrounding communes. Cross-river connections were improved by building the Mülheim suspension bridge. Accommodation for fairs was provided in the great Exhibition Building in Deutz-Mülheim on the east side of the river. Provision was made for further extension on the Cologne side to the north of the city, where new port facilities were planned at Niehl. The city was completely demilitarized after 1918. This permitted its expansion along the Rhine.

The city administrative area expanded after 1918 to about 250 sq. km. It thus became the second largest city in area in Germany after Berlin. The absorption of the great industrial areas on the east bank that are clustered about Deutz (annexed in 1888) necessitated the provision of more bridges across the river, in addition to the railway bridge that was opened in 1859. But the area that is closely allied, socially and

economically, with Cologne, extends beyond its administrative limits, to embrace a total population of about one million, three-quarters of which lived within the city proper.

Cologne has always dominated the lowland bay on the western side of the Rhine. This is a highly productive farming land. But to these agri-

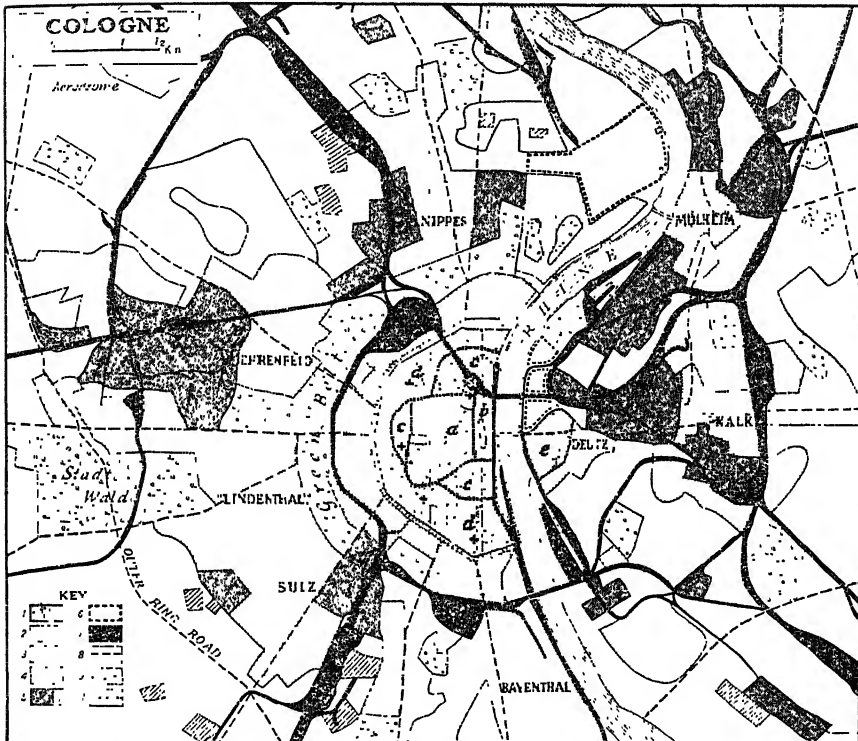


FIG. 75—THE GROWTH OF COLOGNE (*by the author*) (scale, 1 : 60,000)

- | | |
|--|--|
| 1. Fully built-up Old Town and modern City centre | 6. Public buildings areas |
| 2. Fully built-up residential areas | 7. Railways and wharves, etc. |
| 3. Partly built-up areas | 8. Main roads |
| 4. Open built-up areas (sub-urban—under 40%) | 9. Parks |
| 5. Industrial areas (including out-lying brickworks) | 10. Stages in the extension of the historic city; a to e show stages of expansion of the old town (see text) |

cultural resources must be added the development of lignite or brown coal in the last fifty years. The field lies in the Ville upland. There was some production on a small scale in the sixteenth century but large-scale production from vast, open quarries dates from 1893. The beds range from 30 metres to a maximum of 103 metres in thickness. The production of lignite averages about 40 million tons. One-third is used directly

as a fuel, mainly for the generation of electricity, the Goldenbergwerke being the largest plant of its kind in Germany. Two-thirds is used for the making of briquettes. Vast quarries, briquette factories, four vast power plants, many industrialized villages in the eastern edge of the Ville, and a network of mineral lines, characterize this area. Electricity is distributed over a wide area and is a chief source of supply to Cologne and the Ruhr. There has been relatively little concentration of new industrial plants on the lignite field for these reasons. (Pl. 6.)

Düsseldorf (535/421), situated further downstream on the opposite bank of the Rhine, is Cologne's greatest rival for economic and cultural supremacy in the Lower Rhinelands.

Düsseldorf has had a different historical development from Cologne. Neuss (60,000) on the opposite bank of the Rhine was a Roman settlement and of greater importance as a church-market centre in the early Middle Ages, for it then lay on the bank of the Rhine and on the great Roman and medieval route. This route ran parallel to the left bank of the Rhine from Cologne. The Rhine shifted its course in the Middle Ages, so that Neuss was left dry and was displaced by Düsseldorf as the ferrying point across the river. The village of Düsseldorf at the mouth of the small Düssel stream was raised to a town. Beginning in the late fourteenth century Düsseldorf was the capital of the dukes of Mark for four centuries, a fact which is clearly reflected in its plan and build. Its topographic growth was as follows: (1) the original nucleus on the Rhine, clustered around the market place and Lambertus Church; (2) extensions of the Neustadt by Jan Wellem (1690-1717), and Karlstadt and Hofgarten by Karl Theodor (1743-99). These rulers also furthered the development of art and the construction of many buildings. Art and culture make Düsseldorf an outstanding city in west Germany.

Its modern functions are intimately tied up with the Ruhr industrial area. As at Cologne, railway facilities to the Ruhr and a frontage on the Rhine have facilitated the growth of heavy industry. It also has the headquarters of many large Ruhr concerns. Chemical and heavy engineering industries are located on the Rhine and especially on the southeastern outskirts of the city. These draw their supplies of iron, steel and fuel from the Ruhr.

Düsseldorf is also intimately connected by stream and electric railway with the textile and industrial area on the left bank of the Rhine. This area has its biggest concentration between Geldern and Grevenbroich. Formerly wool- and linen-weaving was widespread as a cottage industry, but has been concentrated in factories during the nineteenth century. München-Gladbach (128/110) has nearly 40 per cent of its workers in the textiles industries, Viersen (34,000) a third, Krefeld a fifth. The chief products are cotton, silk, artificial silk, and artificial wool. The silk

industry is concentrated mainly in Krefeld, which together with Uerdigen, an industrial centre situated on the Rhine, had a population of 170,000 (1946, 150,000). München-Gladbach is the centre for cotton-weaving, and together with Rheydt (80/69) forms a single urban area.

THE AACHEN INDUSTRIAL DISTRICT

This district lies on the northern border of the Rhine Massif west of the Cologne Bay and interlinks Cologne with Liège and Maastricht. A peneplain, 300 metres in altitude in the south and sinking to 230 metres in the north, lies at the foot of the scarp of the wooded Venn plateau. The peneplain has little forest, and is devoted in its southern section to meadowland and in the northern section to arable farming. It extends from Verviers through Dutch Limburg to Düren. It is drained in part to the west by the Vesdre, and in part to the north by several small rivers that flow from the Hohes Venn. These are the Vicht, Wurm, Inde and Rur. The basement consists of impervious rocks and the soils are thin clays. Westwards the zone merges into the *pays de Herve* in Belgium, in which rolling chalk hills, capped with clay soils, afford a basis for a hedged countryside devoted to a pastoral economy. The geological basement is faulted in such a way that small coal-fields are preserved in synclines, while the beds, dipping northwards, provide measures that are now being reached by deep shafts in Dutch Limburg. These coal-fields lie just north of Aachen. There are also brown-coal quarries west of Düren and brown-coal reserves, at considerable depths, between Düren and the Erft valley. Above the lowland rises the chalk scarp of the Aachen Wald that overlooks Aachen. To the northwest, this peneplain is buried beneath the upper terrace of the Meuse whose gravel deposits are found at heights of 200 metres.

Aachen (160/110) lies at the foot of the Aachen Wald on the undulating lowland of the peneplain and is overlooked again on its northern side by the Louisberg, a wooded outlier of the Aachen Wald, that rises about 100 metres above the lowland. The settlement owed its beginnings to the warm springs that rise from the foot of the upper Devonian limestone, for it was because of these healing waters that Charles the Great selected this site as his imperial seat. The cathedral lies in the centre of the town, and dominates an oval nucleus, which was enclosed by a second circular wall in the fourteenth century. The latter is now represented by a circle of streets, and beyond these lay open land until the late nineteenth century. Subsequent extensions have taken place to the north and west. The economy of the modern city depends mainly on its cloth- and needle-making industries. Aachen did not enjoy a good location, for it lay south of the main Roman and medieval highway that ran from

Cologne to Maastricht. It also soon became a frontier town on the western border of the Reich. It is known to most British visitors as the first frontier station to be encountered on entering Germany by the main route from Brussels to Cologne. The field of influence of Aachen is therefore greatly restricted by the high Venn plateau some 10 to 15 km. to the south and by the semicircle of the Dutch-Belgian frontier 4 to 6 km. from the city centre.

The district of Eupen (like Malmedy to the south) is German in speech and linked with Aachen, but was handed to Belgium after World War I. Thus, owing to the frontier restrictions, Aachen is hemmed in to the west, north and south, so that its associations extend mainly eastwards in German territory. Its unfavourable location is reflected in the disuse of the furnaces of Rote Erde that used to employ many workers.

The industry of the Aachen district originally depended on local ores, and timber and running water in plenty were available in the valleys of the Eifel and along their courses across the lowland. Iron-mining and forges grew in the Vicht valley, and brass-works were developed in the seventeenth and eighteenth centuries at Stollberg by religious refugees from Aachen who used local supplies of lead and zinc. This mining has disappeared and coal-mining has gradually increased in importance. Coal measures are mined in the Wurm and Inde valleys near Aachen and Eschweiler. On this resource depends the present smelting of lead and zinc, both of which ores are now imported. Even the coal-mining suffers, however, from the competition of the coal of Dutch Limburg and the Belgian Campine. The mining of lignite has developed to a small extent in recent years.

Eastwards this lowland zone merges into the *Börde*. This is the fertile arable land that borders the northeastern slopes of the Eifel and is traversed by the valleys of the Rur, Erft and Swist. Where the old highway from Flanders through Aachen crosses these valleys on the edge of the plateau *en route* to Bonn lie several of the oldest urban centres in western Europe, notably Düren and Jülich on the Rur, and Euskirchen on the Erft. These towns are small and industry of little importance in this area. Of its seven chief towns, several began as political-administrative centres, founded by territorial lords. Two of the seven towns lie on the edge of the plateau, the rest form a series along the historic route from Bruges through Aachen to Cologne. Euskirchen is a cloth-making town. Düren, sited on the lower terrace of the Rur, is a seat of paper, leather and metal industries. It is the chief centre of an industrial urban strip that stretches for about seventeen kilometres along the Rur. Jülich and Zülpich are also historic towns in this group.

THE WESTPHALIAN LOWLAND

This lowland lies between the Teutoburger Wald and the northern border of the Sauerland, or, in other words, the southern border of the Ruhr industrial area. It formed the original nucleus of the territory occupied by the Saxons, and belongs to the Low German culture sphere. After the victory of the Franks under Charles the Great in the eighth century, it was brought under the predominant influence and territorial control of the Church through the bishoprics of Münster, Paderborn and Cologne. Münster, in particular, is its geographical focus and the seat of the bishops who for centuries directed and influenced the life of the whole area that lay within its diocese. With the abolition of the temporal power of the bishops at the end of the eighteenth century, a new kingdom was established under French control, and a Prussian province was forged out of this area, with the name of Westphalia. The boundaries of this new province antedated the great areal changes in social and economic activities and the growth and movements of population of the next century. The Osnabrück-Bielefeld area to the east and the Paderborn plateau and the Sauerland to the south, and much of the present Ruhr area, lie within its area. The western boundary lies near, and parallel to, the Rhine. Our concern here is with the nucleus of this province, the lowland of which Münster is the capital and which is distinct from its neighbours.

The Westphalian Lowland remains essentially a rural area, with the exception of small cotton-manufacturing towns such as Bocholt, near the Dutch frontier. The area is also characterized by isolated farmsteads dotted about the countryside that have budded from initial villages in the Middle Ages. (Pl. 17.) These farms are located in the midst of their fields, or are found in the heath, with walled or hedged or fenced fields, known as *Kämpe*. Near to the farms of the smaller peasants (*Kotter*) are the farmsteads of the larger holders (*Meierhöfe*), surrounded by moat and mound, with the great farmstead of the old Saxon type with outbuildings grouped around it. The *Langstreifenflur* or *Esch* with a cluster of farmsteads around it, forming a *Drubbel*, are characteristic of its settlements. The country seats of the old nobility are surrounded by moats (*Wasserburgen*).

These varied landscape features occur on a fundament of marls, limestones and sands (Upper Cretaceous) that are plastered with glacial deposits. These underlying deposits are sharply tilted (by the Saxonian Folding) against the southern border of the Teutoburger Wald, but on the southern border of the lowland they are horizontal and form the barren, dry, limestone platform of the Haarstrang. This is a long east-west strip, running west from Paderborn north of the Ruhr river valley. The western portion of this belt is now occupied by the great

urban area of the "Ruhr". The compact irregular village, the *Haufendorf*, in which the three-field system was formerly practised, is the dominant feature in the present countryside of the Haarstrang and stands in complete contrast to the lowland to the north with hedged fields and isolated farmsteads. The horizontal beds of the Haarstrang form a well-defined scarp that faces south overlooking the green valleys of the Ruhr and Möhne that are cut to depths of 140 metres into the impervious rocks of the Rhine Plateau. The limestone platform merges northwards into the clay plain (Emscher Marls). Springs rise to the surface on the border of the two zones and account for the location of a series of small towns, of which Paderborn is the chief, where the springs bubble to the surface in the heart of the town beneath the shade of its old cathedral. This series of towns was linked by the famous east-west highway known to this day as the Hellweg, which linked Bruges, Cologne and Duisburg with Paderborn, Magdeburg and Leipzig. Low hills of harder rocks, trending from east to west, are the result of differential erosion by the Lippe and its tributaries. They dip northwards and have slight scarps facing southwards. A very shallow trough runs northwest from Hamm along the outer scarp of the central Chalk platform of the Münster Bay (*Mucronaten Stufe*). The centre of the lowland, in which lies Münster, is covered by horizontal strata of marls and limestones which rise from beneath the cover of glacial boulder clays to form low hills on the east and west flanks in the Beckum Plateau (173 metres) and the Bauberg (186 metres). Between the central boulder clay district and the Teutoburger Wald lie extensive deposits of fluvio-glacial sands, twenty-two to twenty-eight metres thick, that form a great belt of heath that runs parallel to and south of the Teutoburger Wald (Pl. 15).

Münster (133/86) is situated in the centre of the lowland at the junction of the chalk platform and the sandy heath. It was the site of a bishopric established on a preceding Frankish *Königshof* (Latin, *Curtis*). The bishop's immunity was walled to form a stronghold in 1150 and the town spread from this nucleus by radial routes, its market place hugging the eastern side of the stronghold at the main exit through the wall. It is a typical regional urban focus that occurs often in the German lands. It is an ancient cathedral centre, and, moreover, a staunch seat of Roman Catholicism. It is also the seat of a university, and enjoys other activities in virtue of its being the administrative centre of Westphalia. Thus, it has administrative buildings, and large barracks on its outskirts as a regional military headquarters. Furthermore, owing to a good situation on the railway, and the proximity of the Dortmund-Ems canal that skirts the south of the city, it has a variety of industries.

Westphalia, west of the Weser, after the Frankish campaigns against the Saxons, experienced a peaceful development, and its urban settle-

ments often grew around an ecclesiastical focus, a bishop's residence, church or monastery. Few towns had their origins in early burghs or castles, or in the settlement of merchants, of whom there is usually no record until town status had been reached. The urban forms were closely related to the village forms, and were not planned units, since the town was the final product of a process of continuous legal and topographic growth from village origins. Very few towns began as planned settlements. There are only about a dozen planned units in the area and none of these attained economic significance. The Westphalian Hellweg, from Cologne east to Paderborn, was an east-west route, but the area had no important north-south land or water routes to stimulate urban development. Soest, Paderborn and Dortmund lost much of the pre-eminence in the later Middle Ages, which they enjoyed in the twelfth century. This loss of commercial prestige was also due to the movements of the chief centres of trade to eastern Germany.

Irregular radial plans are dominant among the small towns in the Münsterland and the Hellweg. A radial arrangement of irregular main streets around a nucleus is characteristic. This nucleus usually has its centre in the market place and, separated from it by a row of houses or the Rathaus, is the place (originally the cemetery) in which the church is situated. The gradual development from such a nucleus, be it a group of farmsteads or a church or a fortified farm, to a market settlement, is reflected in the continuous topographic extension from the root settlement. The later addition of a wall with the grant of town law is followed by the building up of the enclosed area either by a regular street net or by the adjustment of the outer streets and blocks to the curve of the walls. This compact radial layout is well represented in the Münsterland. The type, however, is rare east of the Weser, except in those towns that began as cathedral strongholds.

Other examples are offered by the towns along the Hellweg. Although a trackway of great antiquity, the Hellweg was first established as a fortified routeway by Charles the Great at the end of the eighth century. The route ran from Duisburg to Paderborn along the open loess country. From Paderborn there were three branches to the crossings of the Weser, i.e. due east (the Hellweg proper) to Höxter; down the Diemel valley to Helmarshausen; down the Nethe valley to Hameln. A series of *curtes* was established on this route, at spring points, and at regular intervals of some fourteen to sixteen kilometres. Around these points there were also groups of farms. After the conquest of the Saxons, there emerged on this route trading centres, imperial residences and a bishopric, and these were usually founded on or near an existing *curtis* or village. Paderborn became the seat of a bishopric in 805, and was walled in 900. Geseke was also walled at this time. Weil was reputed

for its salt, and received rights of market and coinage in 973. Similar rights were granted to the monastery at Essen in 1040. But of greatest importance in the early Middle Ages were Dortmund and Soest. Dortmund is first recorded in 899 and in the tenth century it must have been one of the chief emporia in Germany, for the law of its merchants was adopted for new market settlements, granted by the Ottos, on the continuation of the Hellweg east of the Weser (Horohusen, Helmarshausen and Gandersheim in the tenth century). Soest had a *curtis* and was noted for its salt in the tenth century. It early became a church centre. Town rights were granted in the thirteenth century to other places on the route which grew gradually from varied origins—Essen, Unna, Werl, Salzkotten and Brakel. Along the line of the Hellweg, therefore, there already existed in the eleventh century three towns of great importance, Paderborn, Soest and Dortmund, and in addition a number of other settlements with urban character, which, however, received full town rights more tardily.

THE RUHR DISTRICT

“The Ruhr” is usually taken to mean not the winding river of that name in the wooded plateau of the Sauerland, but the industrial area to the north of it, the greatest industrial complex in Germany. The heart of this *Ruhrgebiet*, as shown in Fig. 76, is the complex of urban centres and industry with a density of 2,400 persons per sq. km. that lies on the east bank of the Rhine between the east-west courses of the Ruhr and the Emscher rivers. It extends west of the Rhine to include the small coal-field of Moers with 20,000 coal-miners and the rock-salt-producing area at Rheinberg. It extends north to the Lippe river, and east to a line from Hamm (with the biggest marshalling yards in Europe), and to Unna and Schwerte on the Ruhr. The whole area of the regional planning authority known as the *Ruhrsiedlungsverband* covers 5,000 sq. km. and about 4.5 million people and extends beyond the boundaries just indicated, northwest to Emmerich and Kleve, west to Geldern, and south-east to Hagen. This area embraces 0.8 per cent of the total area of the pre-war Reich, but contains 10 per cent of its total population, 25 per cent of its railway net, 30 per cent of its traffic, 70 per cent of the coal, 80 per cent of the coke, and 70 per cent of the pig iron and steel production. With the loss of the small fields of the Saar and Upper Silesia the dominance of the Ruhr over the economy of Germany is now much greater than before World War II.

Defined more narrowly and specifically as the group of urban areas from Duisburg-Ruhrort to Dortmund, as listed at the end of this chapter, the Ruhr complex had in 1939 $3\frac{1}{4}$ million people on about 500 square

miles. In 1946 the population was $2\frac{3}{4}$ millions—a small decline in view of the havoc wrought throughout the area by bombing. This is the complex with which we are now concerned.

The site of the Ruhr is shown on the map of terrain areas, Fig. 72, p. 462. The central feature is an east-west belt of open, well-drained, undulating country, which is a westward extension of the loess-covered platform of the Haarstrang. Northwards, this belt merges into the ill-drained floor of the Emscher beyond which stretch plains of sand and

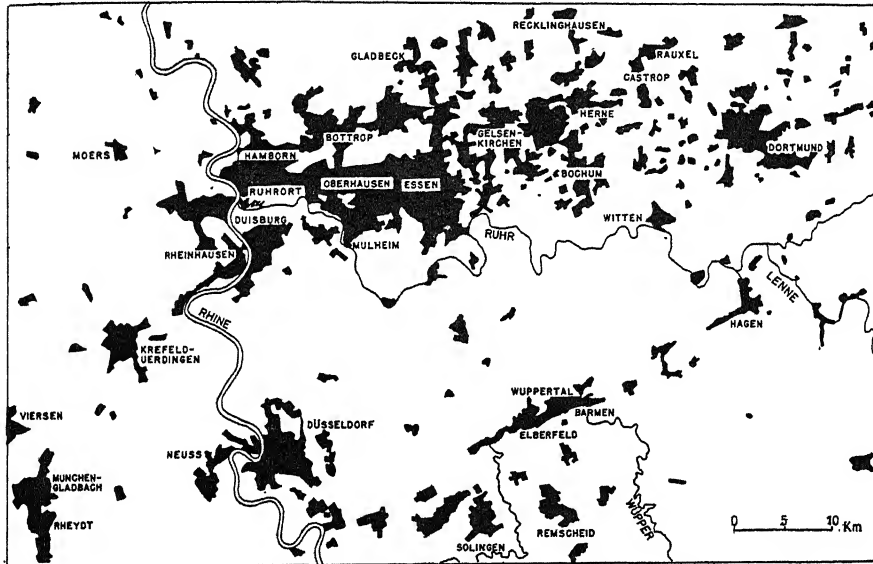


FIG. 76—THE RUHR: BUILT-UP AREAS (scale, 1 : 750,000)

The Rhine-Herne Canal runs through the open belt on the north side of the area, and joins with the Dortmund-Ems canal to the northwest of Dortmund. The canal forks to the Rhine at Oberhausen, one to Ruhrort, the other to Hamborn (see Fig. 40).

gravel covered with wood and heath land. Southwards, there rise the wooded and pastured hills of the Sauerland through which the Ruhr cuts its valley above Mulheim. Westwards, the land merges into the terraces and flood plains at the confluence of the Ruhr and Rhine. The well-drained undulating strip affords a natural routeway east from the Rhine, on which its principal towns developed during the Middle Ages. But the modern growth of the district is due to the development of resources deep beneath the surface of the land.

Coal is the *raison d'être* for this great settlement complex. The coal-field consists of a series of basins, with a northeast strike, whose strata are faulted and overthrust, although the surface of the land cuts across the grain of the outcrops (Fig. 77). Discordantly lying above these coal

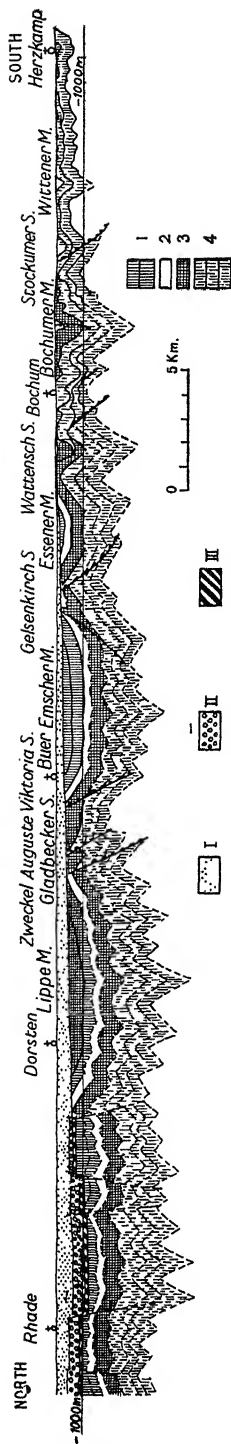
measures are unfolded (Upper Cretaceous) strata that dip northwards, from a line joining Duisburg-Bochum-Horde-Unna. While the thickness of the Cretaceous strata increases northwards (to 1,400 metres near Münster), the coal basins become wider and the coal seams thicker, and the types of coal more fully represented. The coal measures aggregate about eighty metres in thickness. In the Witten basin along the Ruhr river proper the measures lie near the surface; these are steam coals (*Magerkohle*), poor in gas and smokeless. The Bochum basin contains bituminous coals (*Esskohle* and *Fettkohle*), from which the best coke is made. The Essen basin contains the best gas coals, and the Emscher and Lippe basin contains in addition long-flamed gas flame coal (*Gasflammkohle*). The importance of the Ruhr lies not only in the great reserves of its ninety seams, which go down to a depth of 2,000 metres, and contain reserves of nearly 200 million cubic metres, but in the unique richness of all types of coal. Two-thirds of the production consists of the best coking coal (*Fettkohle*) for which the Ruhr holds the monopoly in Germany, and one-fifth gas and gas flame coal. Steam coals make up less than 5 per cent of the total.

Iron ore was formerly obtained in small quantities from the coal measures. Then better ores were brought from the Lahn and Dill district and later from the Siegerland. Foreign ores, however, were imported in increasing quantities after 1860 from north Sweden, Spain, Normandy and Morocco. But the closest economic ties were established between 1880 and 1918 with German Lorraine and Luxembourg by the interchange of coke and ore. In 1913 the Ruhr drew nearly a quarter of its consumption (3·6 million tons) from these *Minette* ores of Lorraine, and sent 5½ million tons of coke there by rail. The Treaty of Versailles upset this balance and ores had to be imported in great quantities from abroad and domestic production stepped up. Germany supplied a fifth, and Sweden 60 per cent (see pp. 296-8).

Water, a basic requirement for heavy industry as well as for general urban needs, is obtained mainly from the Ruhr and its artificial reservoirs. It feeds, for instance, Germany's greatest waterworks in Gelsenkirchen, that supplies numerous settlements and pits with pipe lines 1,650 km. long. The Emscher, formerly winding through a marshy plain to the north, has been graded and deepened, the land drained, and the course of the river and its tributaries changed into a great drainage system, which collects the used water of settlements, pits and factories.

Economic development of the Ruhr has been rapid and recent. In 1850 coal production was only 2 million tons, and was exceeded by the production of the Aachen district. The first blast furnace was built at Mülheim in 1849. Collieries and iron and steel works were then opened up rapidly by such personalities as Krupp, Stinnes and Haniel. After the

FIG. 77—GEOLOGICAL CROSS-SECTION OF THE RUHR COAL-FIELD
NORTH-SOUTH THROUGH BOCHUM



M = Mulde (syncline)

S = Sattel (anticline)

The main geological deposits, beginning with the youngest, are as follows:

- I. Chalk (*Kreide*)
- II. Bunter Sandstone (*Buntsandstein*)
- III. Magnesian Limestone (*Zechstein*)

Below the last are the carboniferous coal measures, with coal seams in the following sequence (at right):

1. Gas-flame coal
2. Gas coal
3. Coking coal (*Fettkohle*)
4. Semi-anthracite coal (*Magerkohle*)

Below 4 there are no workable seams. Horizontal line shows a depth of 1,000 metres. Reproduced from G. Braun's *Deutschland*, 1933, p. 301.

severe depression in the 'eighties, cartels like the Rheinisch-Westfälisches Kohlensyndikat (1893) were formed. Then came vertical integration that combined all processes from the pit to the finished steel product—even to the ship-building yard and the Lorraine ore-field. New coal-pits were sunk farther north and west and the Ruhr emerged as one great agglomeration from Duisburg-Ruhrort-Hamborn to Dortmund. Crisis came in the 'twenties. This was brought about by the French occupation (1923-5), the collapse of money values, the closing down of many smaller pits and furnaces, and the increasing competition of brown coal, water and oil. The climax was the economic crisis of 1932. Growth had been so rapid before 1914 that no attention had been paid to co-ordinated planning of land use, grouping of factories and houses and of amenities. A step in this direction was taken by the formation of the regional planning authority, with full planning powers, in 1921 (*Ruhrsiedlungsverband*) and in 1929, by the reorganization of the local government divisions.

Transport is vital to this heavy industrial area—both for the import of its ores, oils and foodstuffs, and for the export of its multitude of iron and steel goods, coal and the like. It lies within a few miles by canal of the Rhine, the greatest navigable highway in western Europe. It also lies on one of the greatest east-west railway routes in Europe, which links the Low Countries with Cologne and Berlin. It also has an enormous local traffic by road and rail. Indeed, the Ruhr coal-field accounts for a third of all the goods traffic of the German railways. It has 1,250 km. of railway and 1,000 km. of tramways. But the tramways do not form a unified system, and the railways lack north-south connections. The Dortmund-Ems canal and the Rhein-Herne canal (serving mainly for the transport of coal), and the large Ruhrort-Mülheim ship canal, all lie east-west, and serve as feeders to the master artery, the Rhine. The Ruhr river is a source of water and power, but is of no use today for modern navigation. The small barges that navigated the river in the days of the numerous iron-workings, and the forges on the river and its tributaries, have long since disappeared. (See Fig. 40, p. 259.)

Pit and furnace have not a coincident distribution (Fig. 78). The bulk of the coal production is in the province of Westphalia, i.e. in the eastern half of the field (east of and excluding Essen), whereas the western half, in the province of Rhineland, which lies nearer, or on, the Rhine, is the chief centre of iron and steel production. Pits are widely distributed throughout the whole area, but iron and steel manufacture is far more localized in a few large plants. The greatest iron and steel plants are in Essen (Krupps) and Duisburg-Ruhrort-Hamborn (Thyssen), and at Oberhausen on the Rhein-Herne canal, and Mülheim on the ship canal. These plants are located near to the Rhine, whence they receive imported ores direct from river barges. The plants in Bochum and Dortmund,

though important, are less so than those in the western half of the area.

It is a mistake to regard the Ruhr industrial area as one continuous complex of brick and mortar. Pit-heads, pit-heaps, furnaces, slag-heaps, water- and cooling-towers, 80 coke-oven batteries, rolling mills, machine workshops, and oil-distillation plants, are met with throughout the area as its characteristic industrial plants. Rows of small grimy cottages in

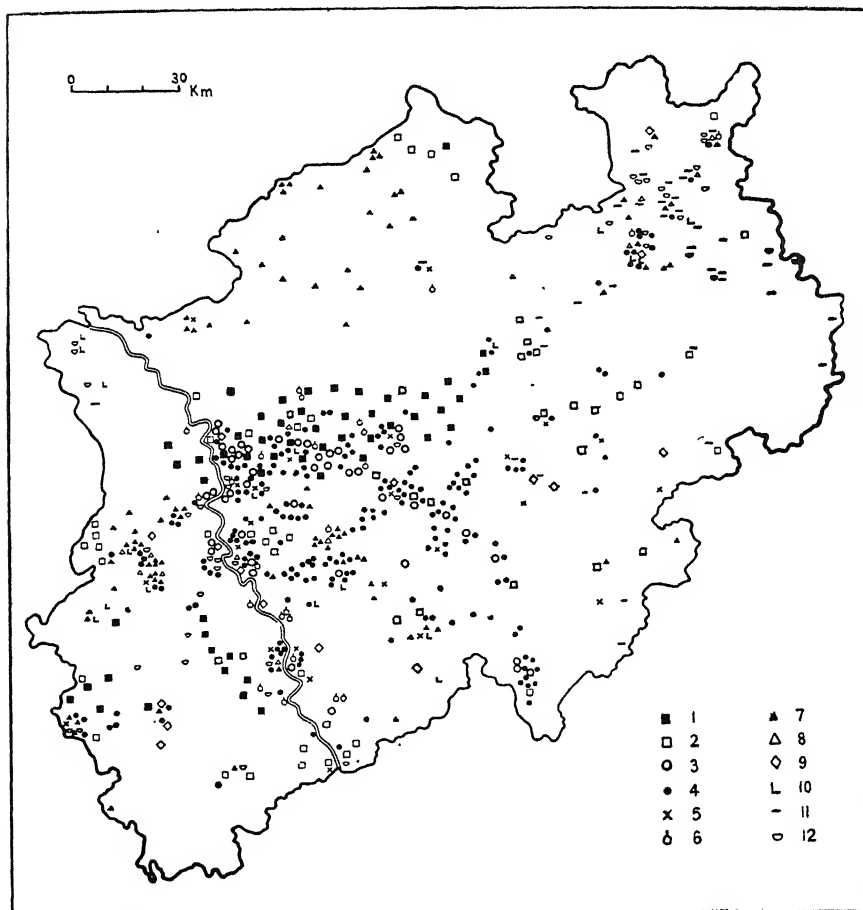


FIG. 78—LAND NORTH RHINE WESTPHALIA DISTRIBUTION OF INDUSTRY (from Vol. 9 of the publications of the Ministerpräsident des Landes Nordrhein-Westfalen-Landesplanungsbehörde, Düsseldorf) (scale, 1 : 2 m.)

- | | |
|------------------------------------|-------------------------------|
| 1. Coal mining | 7. Textiles and clothing |
| 2. Stone and earths | 8. Clothing |
| 3. Iron fabrication | 9. Paper |
| 4. Other iron and metal industries | 10. Leather, boots, and shoes |
| 5. Electro-technical | 11. Woodworking |
| 6. Chemicals | 12. Food and drink |

brick make up the so-called *Arbeiterkolonien* in numerous small groups near the pits. More concentrated, covering much larger and compact areas, are the tenement blocks. These cover great areas, for example, in the Hamborn area (Pl. 5). Great port areas, with railway tracks, wharves for barges, warehouses and industrial plants, occur above all at Ruhrort on the north side of the mouth of the Ruhr, and in the harbour of Duisburg on the south side. Dortmund lies at the terminus of the Dortmund-Ems canal at the eastern end of the belt and is also connected with the Rhein-Herne canal. There are several large wharf areas and isolated large plants along the course of the Rhein-Herne canal. Finally, there are the great urban agglomerations. The chief of these, four in number, form a series, spaced at about ten miles apart from each other, from westsouthwest to eastnortheast. These are Duisburg-Ruhrort-Hamborn, Essen, Bochum, and Dortmund. The more thickly built-up section is the western half. Beyond Bochum there is no big urban area (for Werne and Witten on the Ruhr are relatively small) until Dortmund is reached. In the western half, Mülheim and Oberhausen lie between Duisburg and Essen, and between Essen and Bochum there are Gelsenkirchen, Wattenscheid, Herne and Wanne. North of the Emscher valley there are the new colliery districts, with no industry and open residential districts of single-family houses and flats.

Open land thus covers a large part of the Ruhr. There are meadows in the lower valley of the Ruhr, woods on the terraces between Duisburg and Mülheim and Sterkrade, and much open farmland between the cities, especially east of Bochum. Immediately south of the main cities, in a line eastnortheast and westsouthwest parallel to them, one quickly reaches wooded hill country which drops steeply to the deep wooded valley of the Ruhr. This attractive country offers homes for the more wealthy and open spaces for the many. To the north of the Emscher, the new colliery districts such as Bottrop and Recklinghausen are situated in heath and woodland. The core of the Ruhr is grim, but pleasant open spaces lie within the reach of all and farmland, and old half-timbered farms can be found in the midst of the industrial belt.

The towns of the Ruhr fall into three groups according to the age of their development. The southern series, which is the most important, is linked by the *Bergisch-märkisch* railway. This is the successor of one of the oldest highways in western Germany, the Hellweg. On this route grew the early towns of Duisburg, Essen, Bochum and Dortmund, as well as Mülheim and Wattenscheid. The first four, especially Dortmund, were important medieval cities, with origins dating back to the early Middle Ages, before 1100. These cities have become the principal industrial centres and the greatest in built-up area and population.

To the north of this series is a second group of towns with entirely

industrial origins, based on coal and heavy industry. These are from west to east: Hamborn, Oberhausen, Gelsenkirchen, Wanne-Eickel and Herne. The northernmost series of even more recent development is almost exclusively a coal-mining group. Here are extensive residential areas, without any corporate unity and with many ill-defined centres, since there are no medieval town centres, and the planning of civic centres has not been a feature of their development. Examples are Gladbeck (61,000), Buer and Recklinghausen (79,000).

THE CITIES OF THE RUHR DISTRICT

Let us now consider the main urban areas in more detail, beginning with the principal series in the south (Fig. 76).

Greater Duisburg now includes Ruhrort and Hamborn, and covers 144 sq. km. with a Rhine frontage of 33 km. and a population of 434,000 (1946, 356,000). It consists of several parts and is by no means a compact urban area. There is Duisburg proper to the south of the Ruhr, Ruhrort-Meiderich on its north side clustered around the great harbour of Ruhrort, and, to the north, the complex of industrial and residential sectors separated by open areas that make up Hamborn. The town began as a Frankish fortress at a crossing of the Rhine about A.D. 700. This survived attacks by the Northmen, and became a base for attacks against the Saxons eastwards along the Hellweg. The old town of Duisburg, still partly enclosed by its medieval walls, lies close against the congested harbour (*Innenhafen*) on an old branch of the Rhine. It lies on raised land surrounded by river flats, and was walled in the twelfth century. Around it extends the new nineteenth-century town. The expansion of the new portions to the east is limited by wooded hills of the upper terrace that reach a height of sixty metres in the Kaiserberg, which overlooks the town. Meadows separate Duisburg and its harbour from the great river port of Ruhrort on the north side of the Ruhr. The town of Ruhrort (*Altstadt* and *Neustadt*) is almost surrounded by water. It began with a castle that was erected in 1373 on an island to take tolls on the Rhine traffic, and soon after an adjacent fishing settlement was walled as a town (*Altstadt*). The first wharf was built in 1715, but it was not until the Ruhr was made navigable in 1776-80 that it began to grow. At this time a *Neustadt* was laid out to the north of the *Altstadt* and it had a decidedly Flemish character. The harbour lies at the mouth of the river Ruhr (with a canal to Mülheim) and also receives the Rhein-Herne canal. It dates from the improvement of the Ruhr for navigation by Frederick the Great. Navigation of the Ruhr finally ended in 1890, but the Rhein-Herne canal (1914), and the new canalized channel to Mülheim, as well as the railway net, have contributed to its great importance

as the outlet for the whole industrial area. Meiderich, with a church dating from 874 and a group of farmsteads, remained entirely rural until the mid-nineteenth century. Hamborn, too, has acquired its great iron and steel plants (notably the Thyssen plant) through the proximity of the coal-mines to the great waterways by which the iron ores are transported. The living-quarters here grew around several small rural nuclei. The harbour of Duisburg-Hochfeld-Ruhrort covers 9.2 sq. km. (of which 189 hectares are water), and had in 1913 a traffic of 27.3 million tons (of which 18.3 million tons was coal export) and in 1937, 34.2 million tons. This is the greatest river port in Europe. In addition there are small harbours at Homberg (27,000), Rheinhausen (41,000), both on the left bank of the Rhine, Alsum, and Walsum (23,000). All these are included in the Duisburg-Ruhrort harbour area and serve the industrial complexes immediately behind them. Along this stretch of the Rhine, therefore, on both banks, there are many great industrial complexes including iron and steel plants, copper-smelting plants and coal-pits (Pl. 11).

Mülheim (137/132) lies on the Ruhr and is separated from the Rhine by the wooded high terrace beyond the Kaiserberg. It had its beginnings in the Frankish period, at a bridge-point on the Hellweg route. It was still mainly rural in character at the beginning of the modern era. Its modern growth was first associated with coal-mining and iron-working in the valley of the Ruhr, but when coal-mining shifted to the north and the river ceased to be used for the transport of coal in the 'sixties, its growth was checked, but a new fillip to growth was promised by the recent canalizing of the river as far as the town. The town nucleus is small and still has a number of half-timbered buildings that reflect its earlier rural character.

Essen (665/525), unlike Mülheim, is an old town (Fig. 79). It had its origins in a Carolingian stronghold (as evidenced still by the name of *Burgplatz* and a nunnery or *Damenstift*). Its economic growth was due to its location at the convergence with the west-east Hellweg of a north-south route. The north-south route crossed the Ruhr at Werden (where an abbey was founded in the tenth century) and then crossed a second east-west deep-cut minor valley just to the south of the present urban area of Essen, thence from the site of the market place in Essen the route forked to Wesel and Münster. Essen began as a trade centre, but crafts began to assume importance in the sixteenth century with the working of small arms, using iron from the Mark and coal from the Ruhr valley. In the early nineteenth century, however, Essen had only about 4,000 inhabitants. It was insignificant as compared with the historic town of Dortmund. Modern growth was due to the enterprise of the firm of Krupps in adopting new techniques for the sinking and operation of deep shafts through the beds that overlie the coal measures. So it has

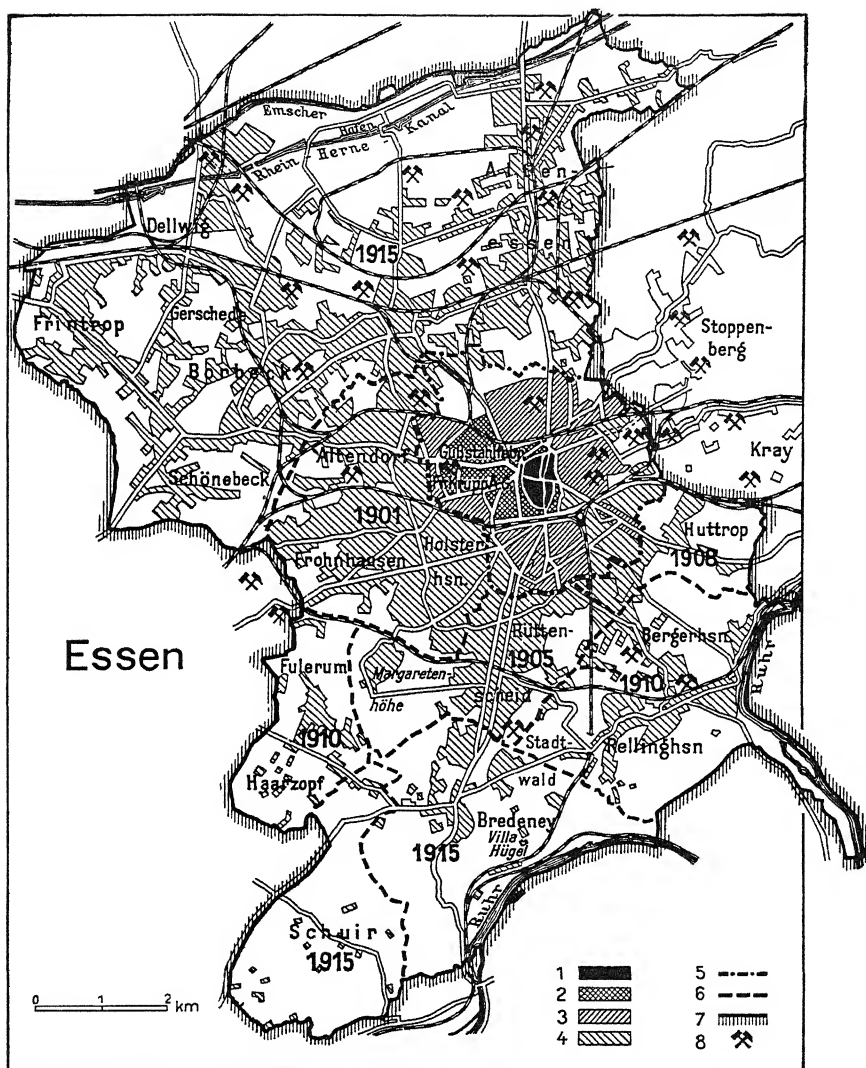


FIG. 79—THE GROWTH OF ESSEN (after Aubin and Niessen) (scale, c. 1 : 100,000)

- | | |
|--------------------------|-------------------------------------|
| 1. Medieval town | 5. Boundary of city |
| 2. Extensions till 1866 | 6. Boundaries of incorporated areas |
| 3. Extensions till 1900 | 7. Boundary of present city |
| 4. Extensions after 1900 | 8. Coal mines |

grown to be a great coal-iron-steel complex in the heart of the modern Ruhr.

The site of Essen and its environs is the undulating chalk country of the Hellweg. This merges southwards beyond the deep narrow valley flowing east to the Ruhr into the hilly wooded country, as far as the high, steep, wooded slopes of the Ruhr valley. Northwards the undulating platform merges into the low-lying, marshy plain of the Emscher. The nucleus of the urban agglomeration is the great iron and steel complex of Krupps on its northern side. East of this is the elongated oval area of the old town that has emerged since 1870 as the central business district. South of the east-west Berg-Mark railway, and covering the southern half of the agglomeration, is the residential area, that spreads southwards sporadically on the open plateau towards the Ruhr valley. The old town had its centre in the *Burgplatz* and the *Münster*, the symbols of its historic character.

The industrial sector is in the north in the Krupps complex, and coal mines and miners' settlements cover the Emscher plain. The old Emscher river bed is now used as main sewage channel for the town. The coal-mining communities occur especially north of the Emscher plain on a higher and drier chalk and gravel-covered platform, with colonies of single-family houses with gardens and small stalls for their stock. The Rhein-Herne canal carries off the coal and brings in the raw materials.

Bochum (305/246) lies eastward of Essen at the junction of another south-north route with the Hellweg. It received town law in 1300 but remained very small until the nineteenth century. There are about fifty pits in the town boundaries and in the centre are the vast iron and steel works of the *Vereinigte Stahlwerke*, employing normally nearly 20,000 workers.

Dortmund (538/436) again lies at a crossways on the Hellweg a north-south route, crossing the Ruhr at Hohensyburg and the Lippe at Lunen. West of Dortmund the Emscher plain was often difficult to cross, and this added to the significance of the site of Dortmund. The town began as a stronghold and *Königshof* and group of farmsteads, and became one of the most important towns in western Germany and a chief seat of the Hansas. The Altstadt is a clearly defined oval-shaped nucleus, whose walls are replaced by thoroughfares. At the peak of its medieval prosperity it had 10,000 inhabitants. But in 1800 it had only about 4,000. Its growth again began with the mining of the best coking coals beneath the Cretaceous cover and the building of its station on the main east-west railway. Then in 1899 the opening of the Dortmund-Ems canal to the north gave added impetus to growth. The business sector is co-extensive with the old town, and is concentrated on the east-west route, whereas

modern industrial plants have been located north of it in connection with the canal, and the residential sectors lie in the southern district. The marked segregation of districts according to function is very clear in Dortmund and is one of the ill results of haphazard growth without overall planning.

The second zone of settlement is the northern and more exclusively coal-mining zone. The zone has its axis in the Emscher lowland towards which we have noticed a definite shift of new industrial plants from the central zone (Figs. 76 and 78).

Oberhausen (192/174) lies north of Mülheim between the Ruhr and the Emscher plain and the Rhein-Herne canal. It now includes, through the absorption of Sterkrade, some of the sand-covered upland to the south. Until the eighteenth century this was an area of sandy heath between the swampy valley floors. In the eighteenth century bog iron ores began to be mined north and south of the Emscher. These were smelted at Sterkrade and in 1790 a smeltery was established on the Emscher stream. Herein lay the beginnings of the great *Gute Hoffnungshütte*. In 1845 came the railway from Cologne to Minden and the station of Oberhausen was named after a castle on the Emscher. The first pits were sunk on the heath and the growth of the settlement began around the station. In 1862 the *Gemeinde* was formed and in 1874 it acquired town law. Further expansion of the great smelting works, coal-mines and houses have caused the centre to merge with its growing neighbours.

Gelsenkirchen (318/266) has grown in the same way. In the 'thirties it had 60,000 men employed in sixty pits. In 1847 it was still a village with 600 people. Amt-Wanne was the name given to a railway station in 1875, named after the field in which it was built. In 1897 it was changed to Wanne. Growth began with the advent of coal-mining in the 'fifties, but it was also an important junction of railways, for which reason it was for long the chief railroad junction at the eastern end of the Ruhr.

Still more recent but similar growth has characterized the places to the north—Wanne-Eickel, Herne, Castrop and Rauxel along the south side of the Emscher. The development of chemical industries based on coal-gas characterize these recent mining areas. Hamm, the chief town of the Mark in 1226, has great marshalling yards at the eastern end of the Ruhr and its growth will be aided by the opening of the new Lippe canal. Mining and houses have now spread north of the Emscher in Recklinghausen and Dorsten.

The Ruhr suffered appalling damage by bombing. Duisburg and Essen have had 44 per cent of their houses destroyed, Bochum and Dortmund 38 per cent, Oberhausen and Mülheim 25 per cent, Gelsenkirchen 25 per cent. But even though many of the factories, such as the great Krupps plant in the heart of Essen, were seriously damaged, the

coal-mines were left virtually intact. The population in 1946 was $2\frac{3}{4}$ millions as compared with $3\frac{1}{4}$ in 1939, a remarkably small change in view of the damage done, and an indicator of the appalling conditions under which much of the population is living. But economic revival is going on apace and life is being resumed on the basis of the same underlying natural resources and within the same general framework of factories, streets, railways and buildings. For the coal and the steel of the Ruhr are essential to the life of western Europe.

Post-war Situation. The British Zone suffered most severely from the war and the heart of this zone is the Ruhr. In September 1945, industrial production in the zone was 15 per cent of the monthly average for 1936. At the beginning of 1946 it was up to 27 per cent. A fall in coal production in the spring of 1946, due to the miners' short food rations, checked the revival, but the average for 1946 was 31.3 and 34.4 per cent in 1947. The level at the end of 1947 was 40 per cent of 1936. But this is small since the population is 15 per cent greater than in 1936. The revival of production varies of course from one industry to another and is least in those which are affected by dismantling policy. It was almost complete in 1947 in building, electricity production and gas production, about two-thirds for coal and half for rubber and chemicals. Iron and steel production in 1947, on the other hand, and textile production were only one-quarter of the 1936 production. Coal production during 1950 was up to its pre-war level. Steel production reached its permitted level of 11 million tons. Other post-war economic developments are considered in Ch. 15.

During 1949 and 1950 there has been a greatly accelerated industrial growth, notably since the stabilization of the mark. The recent agreement signed at Petersburg stopped the dismantling of several big plants in the Ruhr. The chief of these is the Thyssen plant in Ham-born, one of the greatest iron and steel concerns in the world. This will further enhance the industrial revival, that is now generally recognized as the keystone of European recovery. The establishment of the Ruhr Authority in 1948 by the six Powers of the United States, Great Britain, France and the three Benelux countries has now been followed by the entry of the West German Republic. The way is open, it would seem, to renewed growth, subject only to the veto of the military security board of the three Powers. The future of the Ruhr as a seat of industrial production on its pre-war level seems to be assured. The main problem for the Western Powers is to find guarantees that it will not be put to military use. This is taking shape in the Schuman Plan. The main problem for the inhabitants of the Ruhr is rehabilitation, and the ruins of the Ruhr agglomeration offer a challenge to the ingenuity of the planner of town and country. Here is geography in action.

Population of the Ruhr

(Based on official census statistics. See also the list in *Geographisches Taschenbuch*, 1949)

<i>Administrative Area</i>	1933	1939	1946	% Inc. or Dec. 1939-46
Duisburg	440,000	433,500	356,400	-17.7
Oberhausen	192,500	191,800	174,000	-9.2
Mülheim	133,300	136,800	132,400	-3.2
Bottrop	86,000	83,400	80,700	-3.2
Gladbeck	61,000	58,700	61,400	+4.7
Essen	654,500	664,500	524,700	-21.1
Gelsenkirchen ..	332,500	317,500	265,800	-16.3
WEST RUHR (approx.)	1,900,000	1,886,200	1,595,400	-16.0
Wattenscheid ..	62,000	61,400	59,500	-3.1
Wanne-Eikel ..	92,300	86,700	73,700	-15.0
Recklinghausen ..	87,400	78,800	89,800	+13.9
Herne	98,500	94,600	97,400	+2.8
Bochum	314,500	305,500	246,500	-19.4
Castrop-Rauxel ..	58,400	56,600	58,300	+3.0
Witten	72,500	73,500	69,400	-5.6
Dortmund	541,000	537,900	430,500	-18.9
Lünen	45,000	46,000	52,000	+12.2
EAST RUHR (approx.)	1,372,000	1,341,000	1,183,100	-13.0
TOTAL RUHR ..	3,272,000	3,227,200	2,778,500	-14.5

Area and Population of the Ruhr (1933)
 Areas are given in acres (640 acres per sq. mile). Figures in brackets show the percentage of the Total Administrative Areas
 (From *Statistisches Handbuch der Deutschen Gemeinde, 1934*)

	Total Area (1)	Built-up Area Houses, Gardens, Factories (2)	Streets, Railways (3)	Total Built-up Area (Cols. 2, 3) (4)	Open Spaces (5)	Population (6)	Density of Population per acre	
							Built-up Area (Col. 2) (7)	Total Built-up Area (Col. 4) (8)
Duisburg-Hamborn ..	36,000	7,000 (19.4)	5,000 (14.1)	12,000 (33.5)	1,600	440,000	63.0	37.0
Oberhausen ..	19,000	4,800 (25.0)	2,000 (10.4)	6,800 (35.4)	700	192,500	40.0	28.0
Mülheim ..	22,000	3,750 (17.0)	2,000 (9.1)	5,750 (26.1)	500	133,300	36.0	23.0
Bottrop ..	10,000	2,500 (23.8)	800 (7.8)	3,300 (31.6)	150	86,000	34.5	26.0
Gladbeck ..	9,000	1,600 (17.7)	600 (6.7)	2,200 (24.4)	350	61,000	38.0	26.0
Essen ..	47,000	11,550 (24.5)	4,300 (9.2)	15,850 (33.7)	3,200	654,500	57.0	41.0
Gelsenkirchen ..	26,000	5,400 (20.8)	2,600 (9.6)	7,900 (30.4)	1,000	332,500	62.0	42.0
TOTAL FOR WESTERN RUHR (Approx.)	170,000 265 sq. miles	36,600 57 sq. miles	17,300 27 sq. miles	54,800 84 sq. miles	7,500	1,900,000	52.0 per acre 33,000 per sq. mile	36.0 per acre 23,000 per sq. mile
Wattenscheid ..	6,000	1,170 (19.6)	550 (9.3)	1,720 (38.9)	150	62,000	53.0	35.0
Wanne-Eikel ..	5,400	1,700 (31.5)	750 (13.9)	2,450 (45.4)	230	92,300	54.0	37.0
Recklinghausen ..	13,000	2,700 (20.7)	1,150 (8.9)	3,850 (29.6)	350	87,400	32.0	23.0
Herne ..	7,500	2,000 (26.6)	850 (11.4)	2,850 (38.0)	270	98,500	49.0	34.0
Bochum ..	30,250	6,500 (21.5)	2,150 (7.1)	8,650 (28.6)	750	314,500	36.0	24.0
Castrop-Rauxel ..	11,000	1,700 (15.5)	700 (6.7)	2,400 (22.2)	150	58,400	34.0	24.0
Witten ..	11,600	1,800 (15.7)	800 (6.8)	2,600 (22.5)	370	72,500	40.0	27.0
Dortmund ..	68,000	12,400 (18.3)	6,900 (10.2)	19,300 (28.5)	3,400	514,000	44.0	28.0
Lünen ..	9,300	1,150 (12.4)	—	1,150 (12.4)	—	45,000	40.0	—
TOTAL FOR EASTERN RUHR (Approx.)	162,000 253 sq. miles	31,100 48.5 sq. miles	13,800 22 sq. miles	45,000 (27.8) 70.5 sq. miles	5,670	1,372,000	44.0 per acre 28,000 per sq. mile	30.0 per acre 19,000 per sq. mile
TOTAL FOR RUHR .. (Approx.)	332,000 518 sq. miles	67,500 105.5 sq. miles	13,800 22 sq. miles	99,000 (30.0) 155 sq. miles	13,170	3,272,000	48.0 per acre 31,000 per sq. mile	33.0 per acre 21,000 per sq. mile

CHAPTER 19

LOWER SAXONY (NIEDERSACHSEN) AND HESSE

GENERAL (Sheet 6, Fig. 80)

LOWER SAXONY or Niedersachsen is an historical province of northern Germany that took shape and acquired its name during the Middle Ages. The name applies to a distinct politico-cultural entity, but had little or no political significance until its recognition as a new Land of Germany in the British Zone of Occupation. This recognition was simply the acknowledgment of the fact that this area is organized for many purposes as a unit and the historical name is given to it. Its nucleus is the nineteenth-century kingdom of Hanover, its traditional capital is Hanover. The whole area though clearly defined in its core has vague border zones which have always been politically and culturally divided in their allegiances through history. Its main zone of settlement lies on the border of the Central Uplands where there is fertile soil supporting a dense rural farming settlement and a clustering of old and rather small towns that flourished in the Middle Ages at the convergence of routeways from north and south and east and west. This zone is part of the *Börde*. It includes the Saxon *Börde* and the North Harz Foreland. The most remarkable features here are the wide valleys and troughs that lead southwards through the Central Uplands between the large blocks of the Rhine Massif and the Thuringian Highlands. This southern section embraces the Weser Uplands (including their westward extension, centred on Osnabrück, Herford and Bielefeld), that are drained north by the Weser and Leine rivers. To the north of the *Börde* stretch the heath and bog of the Northern Lowland, embracing the large tract of the Lüneburg Heath. A remarkable feature of urban development in the area so defined is the presence in the Northern Lowland of the two great modern ports of Germany, Bremen and Hamburg. Both are historic cities, with their beginnings in the early Middle Ages, although neither of them acquired great importance as ports until the nineteenth century. They revealed their individuality by retaining their political independence as Free Cities under the Third Reich. They are considered in a separate chapter.

Lower Saxony was a frontier zone until 1200. The Saxon fortress of the tenth century and the castle of the eleventh and twelfth centuries played an important part in the growth of its towns. The Frankish *curtes* extended east as far as the Weser. Beyond the Weser small strongholds

were established by the Saxons as centres of refuge and administration (*Gaue Verwaltungsburgen*). From these developed the later strongholds of the tenth century and the medieval castles in the eleventh century. A few castles were established by the Saxon emperors in the Harz Foreland, and later on the Margraves built others in the Altmark as base points for their eastward conquests. This development is reflected in the frequency of the suffix *burgh*, which is applicable to the old Saxon *oppidum*, the tenth-century stronghold, or the medieval castle. No towns, according to Dörries—with the one exception of Bardowick—had their morphological roots in a village. The market settlement was founded adjacent to the village, from which its name was often derived, and the village itself often disappeared through the shifting of its folk into the market settlement, so as to enjoy its privileges. Sometimes the village was absorbed by the spread of the town and enclosed in its wall. Further, the planned merchant settlement seems to have been more frequently the starting-point of urban growth and topographic development in Saxony than was the case in Westphalia. Lastly, many settlements were deliberately founded. Indeed, the great majority of the towns still show a regularity of pattern that is in marked contrast to the towns of Westphalia. They developed as planned extensions of older settlements; as separate walled towns, grafted, as it were, on older settlements; or as entirely new-founded towns. Thus, the fully developed medieval town often originated in several nuclei, each in itself with a distinct layout and organization. These combined forms are most frequent in the foreland and upland zones, for here conditions were most favourable to town growth. Here, in contrast to the Westphalian Hellweg, the great east-west thoroughfares crossed the north-south routes between the Baltic ports and Frankfurt and Nuremberg. In the latter half of the twelfth century, trade relations in Lower Saxony assumed much greater importance with the founding of Lübeck and the growth of the Baltic trade. The definite onset of the eastward movement of colonization was another factor which stimulated trade. It was in this period from 1150 to 1250 that the many planned settlements had their origins.

THE NORTHERN LOWLAND

Heath and Moor of the East Frisian Geest and the Ems-Hunter Geest (Fig. 84, p. 518). Between the Weser and the Dutch frontier lies a thinly peopled, isolated plain divided in its cultural allegiance between the Catholic Emsland and the Protestant Niedersachsen and the Calvinistic Frisians, although *Platt Deutsch* is spoken by all. The variations of relief are well under twenty metres, but the *Marschen* on the coasts and the valleys in the Geest are flat. Gentle rises of this sandy base (that is 20–50

metres thick in East Friesland) form the low ridge of the Hümmling (73 metres), that is surrounded to north, west and south by wide flats of old glacial valleys (*Urstromtäler*) (Fig. 65). Moraines that continue those of the Münster moraine accompany the Ems to heights of sixty-seven metres, and sandstones (Neocomian) outcrop to form hills on the Dutch frontier near Bentheim. Outliers of the Weserbergland are the so-called Eggen ridges that reach 100 to 150 metres.

The *Marsch* and *Geest* terrains are closely interrelated in their human relationships. This fact is revealed by the extent of the historical districts, known locally as *Länder*—such as the Harlinger Land and the Emsiger Land—that lie astride both types of country. The small towns, which are of medieval origin, lie near the contact of the two types of terrain, often on a raised promontory of sandy Geest, like Norden (11,000), the oldest town of East Friesland. The importance of the sales of cattle and horses from the Marsch is reflected in the large size of their market places, whereas the poorer Geest, on which the peasants produce rye and pigs, contribute in less degree to their marketing activities. The old marsh is marked by its rich meadows, its water-pumping mills along the ditches as in Holland, and its compact villages on artificial mounds, farms or fortified churches on isolated hillocks (*Wurten*). Here, too, there are lines of elm trees along the roads and large mansions sited in wooded parks, for this is the habitat of an old-established and prosperous peasantry. On the other hand, the newer marsh or polder, that has been reclaimed from the sea since the Middle Ages, is primarily arable land that produces good wheat crops, and the farmsteads are strung along the top of the embankments along the dikes. Where the sluice gates reach the salt marshes there are small settlements of fishermen and bathing places. In the old marsh many of the villages have the suffix *um* (*heim*), while in the newer polder land the suffix *siel* (meaning a sluice in a dike) speaks of the mode of their origin (Pl. 20). (Figs. 111, 112.)

Settlement apparently began on the raised hillocks of the peat bogs, but in the Middle Ages the sea flooded great areas in East Friesland, in the Jadebusen and Dollart (Ems estuary), for example, and destroyed many villages. Reclamation has taken place since the sixteenth century in the Jadebusen (though it had to be stopped so as not to endanger the depth of water in the harbour of Wilhelmshaven) and in the Dollart. On the Dutch side, much land has also been empoldered. Thus, Jever (northwest of Wilhelmshaven), formerly a port, is now well inland. Emden (38,000), situated on a hillock (*Wurten*), suffered by the shift of the mouth of the Ems after the end of the Middle Ages. It then lost its importance of the sixteenth–seventeenth centuries as a great shipping port with its own shipping companies, though its old buildings and canals and tree-lined *Wall* still remind one of these days of its close association with

the Dutch towns. Its revival came with the opening of the Dortmund-Ems canal by the Prussian government in 1899 and with the opening in 1902 of its new harbour. It has since developed as an outlet for the Ruhr, concerned almost exclusively with the inward movement of iron ore and the outward movement of coal. Wilhelmshaven (104/90) (with the neighbouring town of Rustringen in Oldenburg), was established by the Prussian government in the 'sixties as a navel base. Its importance dwindled after 1918, but was revived in the 'thirties.

Inland the really characteristic *Geest* and *Moor* country begins. Here it is that Stone Age man was succeeded, on the same sites, by the Germanic settlement of the Christian era, when clusters of farmsteads (*Drubbel*) were established around the cultivated *Esche*. (See Chapter 6.) On these lenticles of higher, drier, sandy or loam soils, surrounded by expanses of heath, was the arable land, divided into regular strips (*Langstreifenflur*), worked in common as one field, heavily manured, and continuously cropped with rye. In the Hümmling this system is retained to this day. This manuring, and also the use of the *Esch* at prescribed times by sheep, have disappeared; also pigs have taken the place of sheep. Throughout the Middle Ages the farmers (the *Vollerben*) frowned upon the allocation of land to new settlers in the surrounding heaths of the Mark, so that the settlements remained open and surplus folk either emigrated or took up temporary crafts elsewhere. It was not till after the subdivision of the common lands in the early nineteenth century that the opening up of separate hedged fields (*Kämpe*) with isolated farmsteads took place here. This change was facilitated by new farming techniques made possible by the use of machinery and fertilizers. Dunes and heaths were also afforested with conifers, which stand in marked contrast to the occasional remnants of the initial woodland of birch and oak.

The bogs have been extensively reclaimed since the eighteenth century and in this way settlement has spread to a quarter of Ostfriesland and a third of Oldenburg. Hitherto the great wildernesses that divided communities from each other were used only as poor sheep pasture, for the cutting of peat, and for the cultivation of an occasional field of buckwheat for a few years. Reclamation began on the Dutch side in the Bourtangier Moor and Dutch methods were soon copied by the rulers of Hanover in the seventeenth century. So began the *Fehnkolonien*, rows of farmsteads on canals cut through the bog, and *Moorkolonien* on the edges of the bog alongside the roads, where the peat was burned before cultivation. Reclamation has been mainly undertaken by the State during the nineteenth century and was greatly accelerated when artificial manures began to be used, and when the *Marks* were subdivided. By the older methods, the surface of the peat was burned and buckwheat planted in the ashes.

This was displaced by the Dutch method or, later, by a modified German method (*Deutsche Hochmoorkultur*). Drainage and heavy fertilizing of the bog land are adopted in both methods, but in the Dutch method the peat is cut and removed and the underlying sand is cultivated, whereas in the German method the land is ploughed deeply, especially in recent years, with motor tractors.

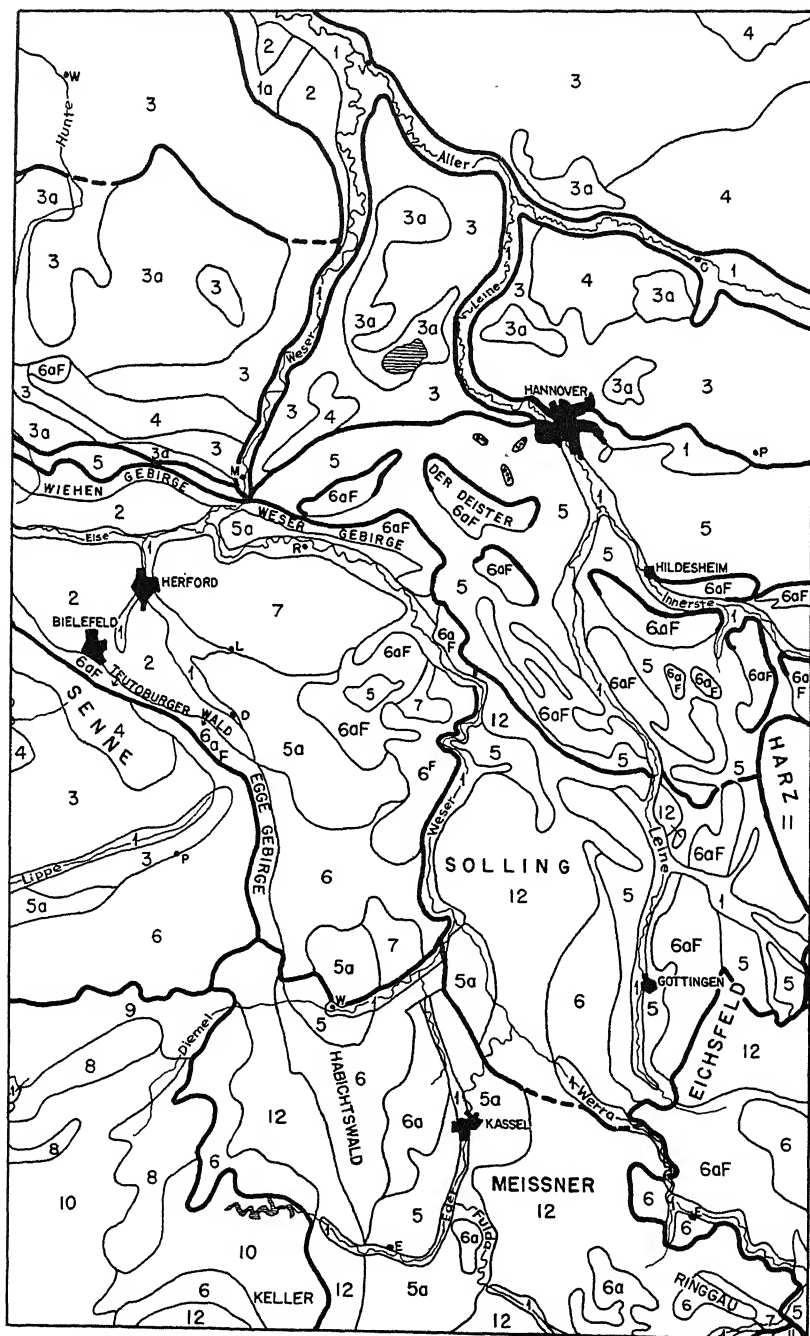
Since the mid-nineteenth century great areas have been settled in this way, and several main canals (Hunte-Ems, Ems-Vechte) cut for drainage purposes. Peat is also used at Papenburg (founded in 1630) for the preparation of litter and dust, and an electricity plant at Wiesmouir supplies 700,000 people with light. Great untouched areas of bog still remain, however, especially between the Ems and the Dutch frontier.

The Lüneburg Heath and Altmark (Fig. 85, p. 519). An upland area, built of glacial deposits, stretches over nearly 7,000 sq. km. between the parallel courses of the Elbe and the Aller-Weser. It merges northwards into the *Moore* and southwards into the Altmark, that finds its southern limit in the bog-filled valley flats of the Drömling and Ohre.

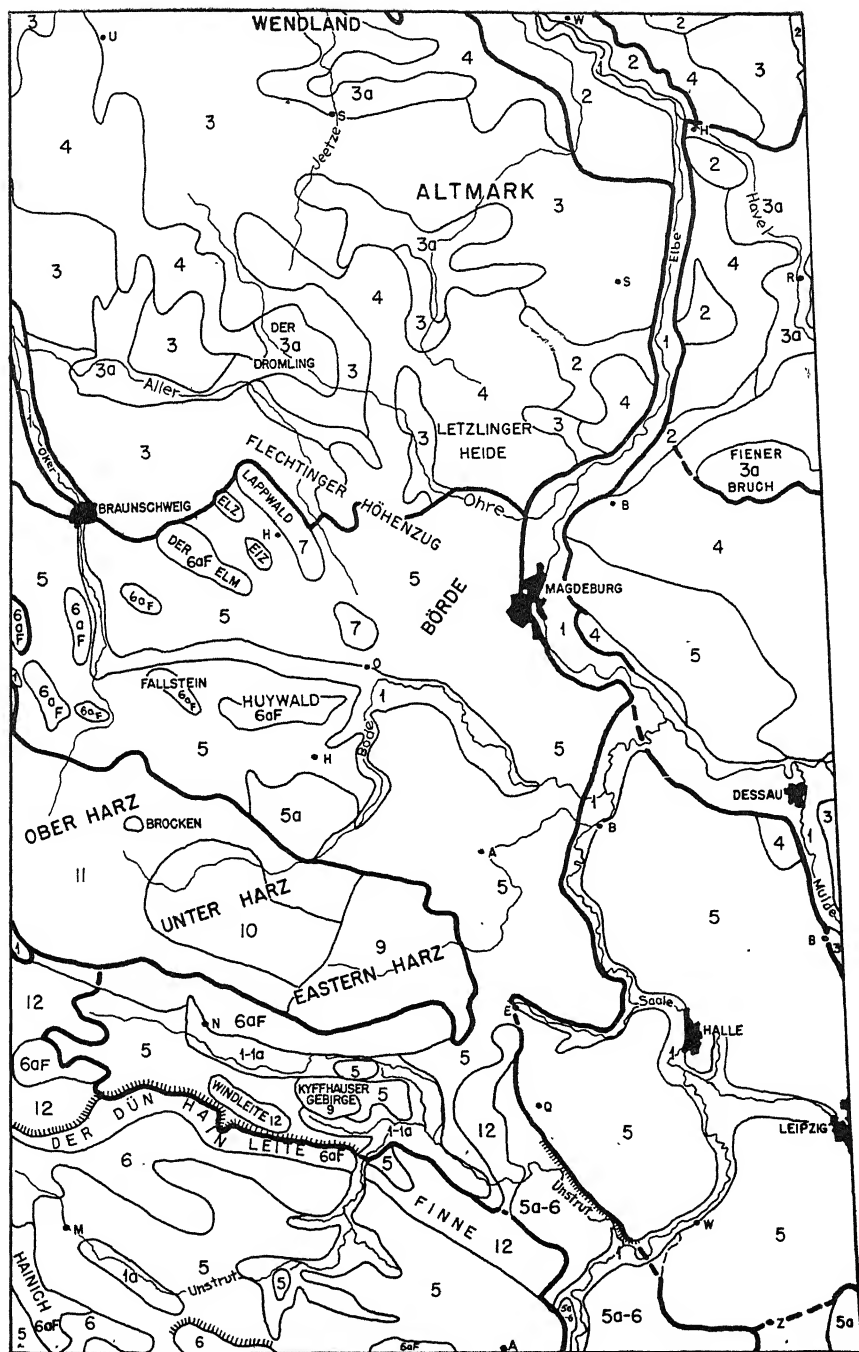
The Altmark falls definitely to the east of the German colonized lands. The Jeetze valley shows a remarkable intermixture of German and Slav settlement forms, although it is more closely allied with the German sphere as is revealed by the fact that during the later Middle Ages it was controlled from Lüneburg and not from Brandenburg. The Slavs spread to the district in the sixth century and reached as far as the Ilmenau where strongholds were erected by the Germans to stem the flow. This island-like area was by-passed in the German eastward colonization. It retains Slav place and field names and village forms, such as the *Rundlings*, on the low and less attractive Geest, as well as Slav traits in the physique and speech of the people, west of the Jeetze. But in both the low Geest and the heath the Slavs accepted German settlement forms, such as the open-field system (*Gewanndürfer*), the Saxon unit farmstead, and the traditional divisions of the free peasantry of Lower Saxony. This land is occupied by the Wends, a surviving Slav group.

The Lüneburg Heath embraces smooth terrain on the south, but the sandy platform drops steeply to the Elbe valley in the north and its front is cut by many short streams. The upland has an average altitude of 80–100 metres, and is surmounted by morainic hills, the highest of which reaches 169 metres. Poor sandy soils support crops of rye, potatoes and buckwheat, although the lowland around Ulzen has a sandy loam which supports wheat and sugar beet and has a density of population four times the average for the heath as a whole (150 persons per sq. km.).

The dry heathland has been occupied by cultivators since Neolithic times and is one of the classical areas of prehistoric barrows, although



FIGS. 80 and 81—TERRAINS AND REGIONS: Sheets 6 and 7.



LOWER SAXONY AND THE MIDDLE ELBE BASIN

[For key see over

many of the megalithic stones have been destroyed. Place names such as *ingen*, *horst* and *loh* are evidence of the earliest Germanic settlement, as are the field system and the open grouping of several farmsteads, irregularly spaced and grouped in relation to the village streets, as in the rest of the Northern Lowland. Larger holdings and farmsteads (*Güte*) are intermixed with those of the peasants. The heath is probably the result of clearance of the natural woodland through the ages by man. Fields and plantations displaced the heath in many sectors during the nineteenth century, so that the scattered patches of heath now make up only a quarter of the whole area, and afforested land covers a third, as compared with a fifth of the area in 1875. The native woods include birch woods, heath with open oak woodland, mixed woods of beech, oak and pines. Since 1768, pines have been systematically planted over large areas, displacing the heath and juniper scrub. The traditional economy involved sheep-raising and bee-keeping, and the cultivation of buckwheat and the manuring of the fields with heather-tops (*Plaggen düngung*). The pig has displaced the sheep. Woodland (with numerous small saw-mills) has displaced the heath, except for a few natural relics like the *Naturschutzpark* of the Wilseder Berg.

The exploitation of rock and earth has contributed to this transformation of the landscape and economy. A green siliceous earth is used for making dynamite and insulators; potash salts are obtained from shafts sunk into the upper *Zechstein* beds; and oil is pumped around Celle in the heart of the heath, where cluster many tanks and derricks.

Settlements are small, the essential centres of the heath land being Ulzen, Soltau and Verden, the bishop's town on the Aller. On the margins of the Heide are the two chief centres of Celle (35/52) and Lüneburg (42/49), but the growth of these has been impeded by that of Hanover and Hamburg.

Celle was founded on a sandy island in a river plain in 1290. It has a grid plan and is adjacent to a castle, which was the residence of the dukes of Braunschweig-Lüneburg until 1705. Its industries are concerned with the treatment of siliceous earth and bees-wax, which are drawn from the Heide.

Lüneburg began as a stronghold of Hermann Billung on a limestone hill, at the foot of which the nucleus of the medieval town is first recorded in 959. Its development is recorded in the motto of *Mons, fons, pons*. *Mons* is the Kalkberg, a gypsum hill; *fons*, the salines—the salt was widely distributed in the Middle Ages and is still mined and has caused much subsidence in the town; and *pons*, the bridge site, caused by the impact of hard limestone on the banks of the Ilmenau. The village at the river crossing merged with the settlement of Lüneburg that included the saline and monastery settlement at the foot of the Kalkberg at the end of

the twelfth century. Later a new town was established to the north with a Neumarkt (*Marktplatz*), and its great town hall speaks of the prosperity of the city before the days of the Thirty Years' War as a salt and trading centre on the highroad to Lübeck. The Sand is bordered by gable-fronted houses, built of brick, in Gothic and Baroque style, and the church of St. Johannis is one of the finest specimens of Baroque architecture. Factories encircle the old town nucleus.

THE WESER UPLANDS

The Weserbergland (Fig. 80, p. 498) is the country north of Kassel, which is drained by the Weser and its tributaries, and contains an alternation of hills and lowlands, framed by the Teutoburger Wald to the west

Figs. 80 and 81. These two sheets cover parts of the Northern Lowland (2, 3, and 4); the Loess or Börde belt and the Saxon Lowland (5); the Harz (8, 9, and 10); the Thuringian Lowland in the south-centre (5, 6, and 12).

1. *Alluvial Plains.* River plains with much surface water and clay or loams. Meadow with little woodland.

2. *Low Plains with Clay or Loam soils.* Mainly arable or grass (50–70%). Some patches of woods and copse. Much surface water. Open fields, some hedges. Villages and hamlets.

3. *Low Plateau (under about 80 m.) of Sand and Gravel: Sandy Geest (Heath).* Mainly arable (50–70%). Some heath and pine forest. Flat, wet, meadow below about 40–50 m.

3a. *Sand and Gravel: Moor (Bog or Fen) (20–50 m.).* Meadows, streams and drainage ditches. Sphagnum moss (*Hochmoor* or Fen) or swamp and shallow lakes with sedge mosses (*Flachmoor* or Fen). Such areas also occur as patches throughout the Geest.

3a. *Reclaimed Bog.* As 3a above. Peat removed, drainage ditches and canals, linear settlements.

4. *Low Plateaus of Sand and Gravel (80–100 m.): Heath and Forest dominant.* Morainic hills reach 100–150 m. Little surface water. Oak-birch woods and pine plantations. Scattered patches of arable cultivation.

5. *Undulating Arable Land on Loess-Loams.* Few streams in shallow valleys. Over 70% arable with compact villages and no dispersed farms. Includes the northern Harz Foreland (*Magdeburg Börde*) and Saxon Lowland. In the latter, many large lignite quarries.

5a. *Undulating Arable Land on Loess-Loams* with more marked relief than in 5 and well-developed valleys in which underlying rocks are often exposed. A little woodland.

6. *Undulating or Hilly Land developed on Horizontal Limestones. Loams.* Woodland and cultivated land, but the latter usually dominant. Compact villages.

6a. *Hilly Land, mainly Limestone Ridges: Wooded (beech).*

7. *Undulating Land: Heavy clays and wooded with much surface water.*

9. *Low altitude Harz Plateau on impervious rocks.* Cultivated clearings with woods and copse.

10. *Undulating Middle Altitude (5–600 m.) Plateau on impervious rocks, dominantly forested.* Some cultivated clearings.

11. *Rugged dissected Harz Highland (600–1,000 m.) on impervious rocks.* Coniferous forest. Includes the Brocken (1,142 m.) and the deeply dissected northern and southern slopes of the Harz.

12. *Plateau on Horizontal Sandstones* with steep-sided valleys. Dominantly forested. Such a plateau with outward facing scarps encircles the Thuringian Lowland (south-centre).

13. *Urban Terrain.* Urban areas around cities with over 100,000 inhabitants.

Note. Heavy lines show boundaries of major physical units (Fig. 13).

and the Harz mountains to the east. The highest points reach heights of about 500 metres and the whole country is traversed by the Weser from the confluence of the Fulda and the Werra at Münden below Kassel to the Westphalian Gate at Minden. Geologically, the basis of the relief is formed by Mesozoic strata that are horizontal in the centre north of Kassel; domed in a great eroded anticline in the northwest, and folded in a series of anticlines and synclines in the north, where differential erosion has produced a diversity of tabular plateaus of limestone and sandstone, monoclinal ridges, lowlands of erosion, and transverse valleys. (Fig. 4, p. 24.)

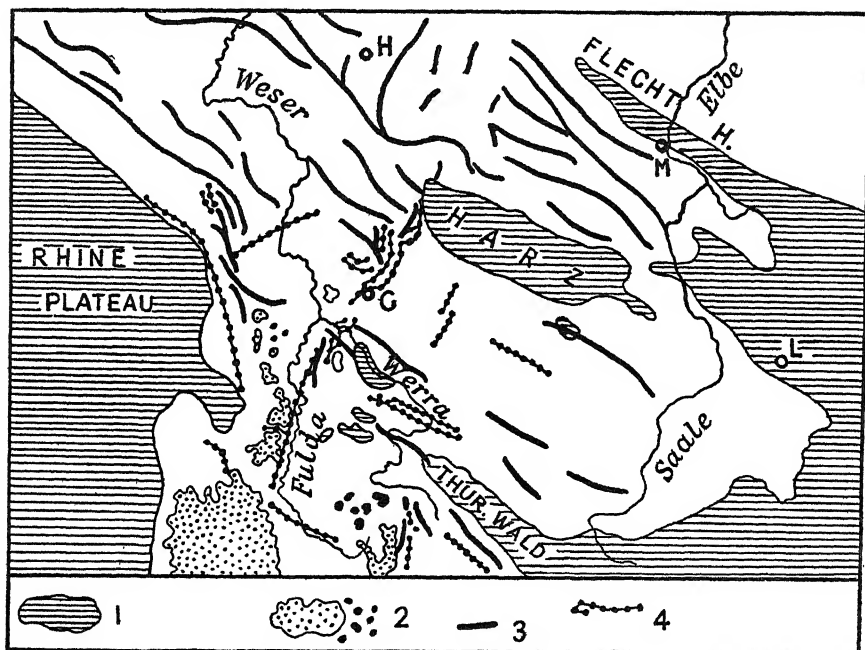


FIG. 82—THE NORTHERN HARZ FORELAND (from E. von Seydlitzsche: *Geographie*, 1925)

Flecht. H = Flechtinger Höhenzug

1. Basement rocks

2. Recent volcanic rocks

3. Anticline of the Saxonian folding

4. Fault troughs

The *Leine Uplands* in the southern section is like the country south of Kassel in Hesse except that volcanic flows are absent, and north-south fault troughs, the chief of which is followed by the Leine, traverse the country in the Weserbergland. The Bunter sandstone forms a uniform, wooded plateau. Above this rise by well-defined scarps the plateaus of the Muschelkalk, through which is sunken the Leine trough. The Weser below Münden cuts deeply through the sandstone plateau. The

Eastphalian Uplands, in the northern sector of the Weserbergland, contains all the Mesozoic strata (and even coal measures at Ibbenburen and to the north of the Deister Upland) and these have been affected by the Saxonian folding with northwest to southeast anticlines and synclines, faults and overthrusts. Differential erosion has developed a variety of local relief. Basins are formed in the soft clays and marls of the Keuper (Lippe district), Lias (Einbeck, Herford), and Wealden series. Ridges and isolated hills are formed by the Bunter sandstone, the Wellenkalk, Muschelkalk, Rät, Malmkalk, and especially the Corallian limestone (Deister, Weserkette, Ith and Suntel hills), Teutoburg sandstone (in the

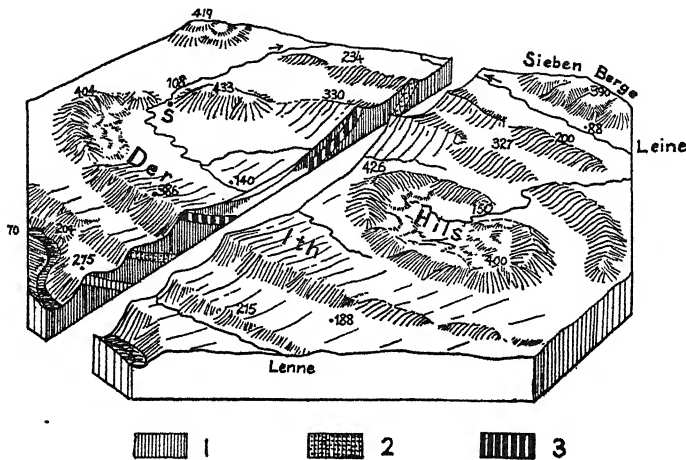


FIG. 83—BLOCK DIAGRAM OF THE ITH AND HILLS IN THE EASTPHALIAN UPLANDS (from E. von Seydlitzsche: *Geographie*, 1925). See also the type area on Fig. 114.

Scarp forming strata:

- | | |
|-----------------------------|-------------------------------|
| 1. Middle Bunter Sandstones | 3. White Jurassic (Limestone) |
| 2. Muschelkalk (Limestone) | |

Osning and Eggegebirge), the sandstone of the Gault clay (Hils), and the Plänerkalk of the Cenomanian. The Ice Sheet covered the northern portion of these uplands and vales, and dammed the northward drainage so that glacial deposition alternated with the interglacial erosion in the valleys (Fig. 83). (Also Fig. 13, p. 83.)

The *Westphalian-Lippe Uplands* to the west is a triangular area extending to the northwest, bounded by the Teutoburger Wald to the south, 100 km. long and 7–15 km. wide, and the Wiehengebirge and its continuation east of the Westphalian Gate. These are the inward-facing ridges of a denuded anticline. The interior lowland has a diversified relief, and forms three sectors, known as the Lippische Bergland, developed on Keuper marls; the Ravensburger Land in the centre, a Lias

depression with Herford in its centre, and the Teutoburg-Osnabrück hill country in the west (Fig. 114).

The complicated relief of this whole area afforded a natural fortress to the ancient Saxons, who had here their chief strongholds (*Fluchtsburgen*) from which they resisted the onslaught of the Franks in the eighth century. The victory of the latter under Charles the Great was followed by the establishment of bishoprics at Paderborn, Minden and Osnabrück at the salient strategic route centres. The strategic importance of this area was enhanced by the ease with which it could be crossed by routes through the passes over the Teutoburger Wald. From Paderborn, which lay at the eastern end of the open limestone belt of the Hellweg, that led like a finger eastwards from the lower Rhine, routes led to the north-south course of the Weser. This river had to be crossed in order to reach the routeways eastwards along the *Börde* and through the uplands to Thuringia. The importance of the east-west crossings of the Weser far outweighed the north-south traffic along the valley itself in these days. The main north-south route, on the contrary, was that of the Leine trough, further to the east, in which lay the medieval towns of Göttingen, Einbeck and Northeim. This route led northwards to Hanover, Brunswick and Hildesheim, which were among the most important towns in Europe in the Middle Ages. Bielefeld commanded the main crossing of the Teutoburger Wald and this route was in fact the most direct continuation of the Westphalian Hellweg. Routes radiated from Paderborn at the eastern end of the latter to the Weser crossings at Hameln and Höxter, the latter being next to the oldest monastic settlement in this Saxon land, sited on the west bank of the Weser. The importance of this country for east-west routes has never changed and is revealed now by the main railway routes that run in the same general direction.

Human occupation in the whole area is diverse. The Solling is a forested and thinly peopled sandstone plateau with its villages strung along the narrow valley floors. The ruling lords introduced the glass industry here in the eighteenth century, though this has almost disappeared and forestry is now the chief occupation. The sandstone hills of the Weserbergland are forested, while cultivated land dominates on the Muschelkalk plateaus, and meadows thread the valley floors. Rich arable land is found on the clay and marl lowlands, especially where there is a loess-loam cover. An improved three-field rotation is usually followed, with special attention given to autumn-sown wheat and sugar beet. In the northwest uplands, flax-growing supported a medieval spinning industry that was still very important as a domestic craft in Lippe at the end of the eighteenth century. In the Bielefeld and Herford districts these industries were transformed and changed with the introduction of

mechanized processes to linen-weaving and clothing making. The Lippe craft disappeared in the 'forties and in its place brick-making developed, that led to temporary migrations in the summer to many parts of Germany in the pursuit of this industry. Industries are varied, depending on local resources and the quality and resourcefulness of the people. Milling and the making of sugar beet, saw-mills and furniture factories are important. Sand supports local glass industries, and salts are mined, and there is also some quarrying of limestone and sandstone. The tobacco-making industry is entirely an innovation, due to human resourcefulness. It is markedly concentrated in the area of Minden-Ravensburg since the 'forties as a domestic craft in the countryside.

Towns are numerous, small, and evenly distributed, and include some of the oldest urban centres east of the Rhine. They include health resorts that use local mineral waters, such as Bad Pyrmont and Salzungen. But the only two medium-sized towns are Göttingen and Hameln. The former grew as a medieval town in the thirteenth century on the north-south Leine route and acquired its university in 1737. Hameln grew at the crossing of the Weser from the Hellweg and the rocky constriction of the valley caused it to be a transshipment point and favoured also the establishment of mills driven with running water. Milling is still the chief occupation in the town. The chief towns, however, lie in the northwest; they are Herford, Minden and Bielefeld. Each is an outstanding route focus. Minden has not attracted much industry in contrast to the other two. *Bielefeld* (126/132) has passed from one industry to another. The old-established linen industry was followed by the making of washable linen clothing, then sewing machines, and then light engineering industries. The sequence of these industries permitted the easy transfer of skills, machinery and investment from one to the other. *Osnabrück* (104,000) is an ancient bishopric and is today an important focus for the human activities of much of this general area and this importance is heightened today by the fact that it is a big railway centre. It has continued its traditional role as a market and administrative centre. Textile, tobacco, paper and engineering industries (steel, copper and wire making) dominate its present urban economy. These important iron and steel fabricating industries commenced, as in the Weald, by using local charcoal, iron ores and local coal, but are now dependent entirely on supplies brought over considerable distances from other areas.

The political make-up of the Weserbergland is one of special interest and importance in assessing its individuality and its space relations with neighbouring territories. Down to the end of the eighteenth century, it was politically subdivided. In it were the territories of the Grafschaft of Ravensburg; the bishoprics of Minden, Osnabrück and Paderborn;

the principality of Lippe; the county of Schaumburg-Lippe; the dukedom of Brunswick; and several other territories around the latter to the north and south that were part of the electoral duchy (*Kurfürstentum*) of Hanover. For centuries, therefore, the human life and organization of the whole area was greatly subdivided by the existence of small, interdigitating political territories. The whole, however, had certain common characteristics throughout the historic period and has maintained its individuality in its modern development since 1800. The whole area north of Kassel has close cultural and economic ties with Hanover and the province that today is called Niedersachsen, but the northwestern upland, centred on Osnabrück and Bielefeld, has close ties with the Prussian province of Westphalia to the west. In dialect, also, the whole area belongs to north Germany (the southern boundary of the Low German dialect runs through Münden). In the west, however, the Saxon unit farmstead is dominant, whereas in the east the Frankish farmstead is dominant, and intermediate types of farmstead lie in the area between. The houses in the small towns also show affiliations in their structure and half-timbered work with Westphalia. The structure and styles of its buildings show affiliations with Hesse to the south, Westphalia to the west and Lower Saxony to the north.

THE BÖRDE (Sheets 6 and 7, Figs. 80 and 81)

The *Börde* is the zone of open, arable land, developed on well-drained loess-loam soils, that lies on the northern border of the Central Uplands. This country is marked as Terrain 5 on Figs. 80 and 81. In the west, at the foot of the Wiehengebirge, it peters out as a narrow strip. In the centre, as the Saxon *Börde*, it broadens to form a wide plain south of Hanover, that is interrupted by low, but sharply defined, hill-islands, and it penetrates deeply into the Weser Uplands. Eastwards, it widens out to form the really typical *Börde* in the northern foreland of the Harz around Magdeburg.

The *North Harz Lowland* (Figs. 81 and 82). This area lies north of the Harz, between it and a low upland, stretching in a southeasterly direction to Magdeburg, that corresponds with a buried upfold (*Flechtinger Höhenzug*) of Paleozoic rocks. The country between these two is about fifty kilometres wide and is a syncline in which there alternate upfolds and downfolds of Jurassic and Cretaceous strata, which were formed during the Saxonian folding. Above these depressions rise anticlinal ridges of *Muschelkalk* (Fallstein, Asse, Elm, etc.). On the slopes of the Harz these strata are upturned to form steeply scarped ridges (*Schichtkämme*) of Senonian sandstone. Lignite beds occur in some of the synclines. Surface drainage and deposits are the result of glacio-

fluvial deposition to the south of the last belt of moraines that lie on the Flechtinger ridge and stretch south to Oschersleben. Much of this underlying structure, however, is obscured by the loess deposits that account for the major features of the countryside. It is the "black earth" soil of the Magdeburg *Börde*—a treeless undulating arable landscape with compact villages and fields of wheat, sugar beet and chicory. This present landscape between the Leine and the Saale is the culmination of long ages of continuous farming settlement since Neolithic times. The district has significant mineral resources that have brought new activities to it in recent years. Iron ores are mined at Salzgitter and form the basis of the big Göring steel plant. Salt has been mined at Schönebeck since the thirteenth century. The Stassfurt district was the first to be exploited for potassium salts. Lignite, too, is mined in considerable quantities in open quarries, especially around Helmstedt (Salzgitter, 45/93,000). (Fig. 113.)

Here are some of the most historic towns of the German lands. They are small, little affected by modern urbanism, and well preserved, with numerous historic buildings. This populous zone, forming a wide open corridor between the Harz and the marshy lowland to the north, is a historic zone of east-west movement and an ancient and fertile settled land. Nestled under the slopes of the Harz there emerged here these first centres of urban life, the early capitals of the Saxon kings and the seat of many German (Saxon) cultural traditions. The most notable of these towns are Quedlinburg, Halberstadt and Hildesheim. Each of the last two had its origin in an early bishop's seat that formed the nucleus of a protected immunity surrounded by a wall and outside of which grew the early medieval urban community of traders and craftsmen.

Quedlinburg grew around a sandstone hill, the Schlossberg, the site of the early German stronghold that was fortified by Henry I, and later became the site of Otto the Great's *Reichsstift*. At the foot of this nucleus the Neustadt was founded in 1200. Halberstadt grew around its fortified cathedral immunity. *Hildesheim* was formed through the coalescence of several distinct towns clustered around the initial nucleus of the cathedral immunity. *Helmstedt*, a fourth small medieval town, that ranks among the earliest towns to emerge in Germany, has its nucleus in one of those small mercantile settlements that crystallized in many places in the north German lands at the end of the Dark Ages with the revival of long-distance trade. While these towns are the principal local market centres of this rich farming zone, its activities are partly oriented towards Magdeburg and Brunswick on its borders to east and west.

Magdeburg (330/236) has lost its historic character through the destruction of its historic buildings by fire in 1631, by its new layout thereafter and, above all, by the growth of modern urbanism. It is now a large

industrial and commercial city, and its functions are clearly a reflection of the character and needs of its surrounding country. It lay at the eastern end of the great natural routeway along the northern border of the Central Uplands known as the Hellweg where it struck the Elbe at one of its easiest crossing points, across which a bridge was early built. It began as the seat of a great archbishopric situated at an easterly outpost of German Christianity against the Slav lands to the east. It was on a high bluff on the west bank of the Elbe, overlooking the flat, low-lying marshland and plains on the eastern bank of the river. Many other smaller towns had similar origins on the western bank of the Elbe and the Saale, as cathedral, communal stronghold, or castle seats, around which urban life segregated. Magdeburg derived trade from the navigability of the great river, both upstream and downstream. Thoroughly destroyed by Tilly in 1631, it rose again from its ashes and revived as a focus on the same site. When annexed to Prussia after 1800, it then became the centre of the new sugar-beet-refining industry for the beet-growing district in the surrounding *Börde* and a flour-milling centre for the same region. The economy of the city is closely tied up with the agriculture and mining of the *Börde* and with the traffic up and down the river. The demands of this same district for agricultural machinery, fertilizers and the like account also for the location of large engineering industries and chemical industries that, of course, also find markets far beyond these immediate environs.

At the western end of the *Börde* is the historic city of *Brunswick* (*Braunschweig*) (190/181), one of the most famous German cities that suffered severely during the war-time blitzes. Unlike Magdeburg, it enjoys no modern navigation facilities, for its small river is not suited to modern navigation. But it has long been a capital city for a state or *Land* that consisted of several scattered territories in the fertile *Börde* zone. It was one of the largest and most flourishing cities in the Middle Ages, since it lay at an important convergence of natural overland routes from east to west along the *Börde* and from north to south through the Weser and Leine troughs.

Brunswick is actually situated in open arable loess land on a small river, the Oker, and in the Middle Ages small vessels were able to sail up to the town. The settlement emerged through the coalescence of seven quite different but contiguous settlements. Its point of origin, its earliest nucleus, was the secular stronghold that was sited on raised ground on the sandy floor of the river bed. The separate settlements were the Altstadt, the Neustadt, the Dankwarderode, Sack, Burg, Altewiek and the Hagen. Each of these was a walled unit with a distinct layout and its own law. These emerged during the twelfth century but it was not until the fourteenth century that one wall surrounded the whole

cluster to form the Altstadt of today and it was not until 1670 that this whole became one administrative unit. In 1400 it probably had about 18,000 inhabitants, only two thousand less than Magdeburg. The city has recently had a new lease of life, for just north of it lies the east-west course of the Mittelland canal with which it is in contact by a branch canal, and it also lies on the main east-west railways. In consequence, a variety of fabricating industries have been established here that are concerned with the manufacture of foods and beet sugar, derived from the surrounding district, and new engineering industries, some of which were established or expanded during the recent war. The Altstadt, however, remained absolutely distinct and well-preserved with its rows of historic houses. Beyond the boulevards, on the site of the old town walls, are clusters of factories, houses and tenements. Both the core and the periphery have suffered from blitzes.

Hanover (465/355) is the capital of Lower Saxony. This city has grown with rapidity from its small size in 1800, when it had 12,500 inhabitants, to 32,000 in 1850, to a total before the war which, together with the suburbs, was well above half a million. The medieval town was sited on the right bank of the Leine valley, a wide and marshy valley floor with several distributaries between the two outlying hills of the uplands to the south, namely, the Lindener Berg and the Kronsberg. This site was at the head of early navigation of the river, at the crossing of the great east-west routeway on the northern edge of the Central Uplands, and the north-south routeway that came northwards through the Hessian depression and down the Leine trough. The site offered firm ground on the right bank and a relatively easy crossing of the river. Here we find several nuclei of early settlement—the village, the royal residence (*Königshof*, Latin, *curia*), and then the market settlement of Hanover. The last was destroyed by Henry in 1189 and the present nucleus of the town was then founded with a main north-south street (*Marktstrasse* or market street) and a parallel street for the traffic overflow in which, until fifty years ago, carts were “parked”. The site of the *curia* lay at the northern end of the town nearest the river and the market place lay in the centre of the elongated plan of the market settlement. Town law was conferred upon it in 1241. The settlement expanded and was walled about 1300. The old castle on the dune (Lauenroder Berg) was demolished and the dune levelled at the end of the fourteenth century, thus making place for further expansion. The settlement of Calenberg Neustadt on the west bank of this river, first mentioned in 1283, was not absorbed into the *gemeinde* of Hanover until 1824. The growth of Hanover in the seventeenth-eighteenth centuries was steady when it was the capital city of the kingdom of Hanover. Its role as a political capital in this period is reflected in the splendour of its Baroque buildings

and places, notably the castle residence and the theatre. The old town was well preserved (until war-time devastation) and contained a large number of half-timbered structures. There has been a marked growth of modern industry and commerce, for Hanover is a great railway focus and only a few miles to the north is the recently completed Mittelland canal. Its railway stations and yards are among the largest in north-western Germany and large industrial plants are concentrated in the Linden district to the southeast. Great industrial plants, concerned with heavy engineering, the production of rubber and synthetic oil, are located north of the city complex alongside the Mittelland canal. There are two congested industrial clusters in the town, one along the river, the other along the railway yards to the north. On the southwestern outskirts is a more extensive and newer industrial area that is identified with engineering industries.

We turn to the extent of Hanover within the framework of the *Landkreis* around it¹ (Fig. 80). The axis of the area is the meadow land of the Leine valley, that was originally marshy, liable to flood, and difficult to cross. To the south of this valley is open, flat, ploughed land, lying on loess deposits, that is interrupted by low and often steep-sided, wooded hills. This is clearly limited to the southwest by the northwest-southeast ridge of the Deister Upland. This area is a part of the *Börde* that extends east to Magdeburg and merges southwards into the Weserbergland. There are deep salt-workings in a small area in the centre of the lowland and several coal-mines along the edge of the Deister Upland, that yield about a quarter of a million tons per year and employ about 3,000 people. Much of the area north of the valley is urban, but rural segments remain. This northern area is sandy land with raised, dry geest and low bog, intermixed with cultivated fields and patches of planted pines and birch (Terrain 3). More productive and undulating land lies in the extreme southeast. The urban area of Hanover extends into these lands without clear limits. The bulk of the urban area lies on the north side of the valley, though modern large industrial development has concentrated on the south side, where the exploitation of the salt and of the coal have been attractions. In this direction, too, there are residential outliers in the Deister Upland. Within the *Landkreis* as a whole the degree of urban influence is reflected in the population curves of the *Gemeinde*. The extreme north and southeast and most of the loess lands to the south remain purely rural and record a stationary or decreasing population. The Deister Upland and its foreland record increases due to mining and residential development. The districts peri-

¹ See *Der Landkreis Hannover, bearbeitet in der Akademie für Raumforschung und Landesplanung und dem Niedersächsischen Amt für Landesplanung und Statistik*, first of a series entitled *Die Landkreise in Niedersachsen*, prepared in collaboration with the *Amt für Landeskunde*.

pheral to the city administrative area show marked increases and have densities over 300 persons per sq. km., and often over 500. These areas are affected by both residential and industrial development.

HESSE (Fig. 90, p. 548)

This province roughly corresponds with the lowland that lies between the Rhine Plateau and the Thüringerwald, and from early times served as a corridor for human movements. In the eighteenth century it contained (Fig. 55, pp. 330, 331) the historico-political unit of the Electoral Duchy of Hesse. This lay between the Eder and the Werra rivers, and extended north to the confluence of the Fulda and the Werra, and south to an east-west line a little south of Marburg and Hersfeld. South of this unit, between it and Frankfurt, lay the *Landgrafschaft* of Hesse-Darmstadt, which became the northern sector of the grand duchy of Hesse. On the western border of these units lay Waldeck and several small counties and, beyond these, the dukedom of Nassau that in the nineteenth century was combined with parts of Hesse and Prussia to form the province of Hesse-Nassau. To the south lay the bishoprics of Fulda, Würzburg and Bamberg, and to the north lay the bishopric of Paderborn. To the east were the states of Thuringia.

In the tenth century the northern section in the Fulda and Werra valleys was settled by the Franks as far north as the Diemel valley; this was called the Hessengau. Immediately to the north, east and west were areas of Saxon settlement. To the south was the uninhabited, forested mass of the Vogelsberg highland and its continuation southwards through the Spessart and Odenwald. But there was close Frankish settlement in the Lahn valley and in the Wetterau, beginning at the site of Marburg, and a third area east of the upper Fulda and Kinzig valleys, which was the northerly limit in the upper Werra basin of the great zone of Frankish settlement in the Main lands. These areas were known as the *Gaue* of Tullifeld and Graufeld. The whole area of the middle Werra and Fulda valleys north to Kassel and northeast from the Vogelsberg had very little settlement at this date. These represent the beginnings of the pattern of medieval and modern settlement throughout this Hessian area. Settlement spread from these nuclei into the surrounding forested areas by means of forest clearance during the Middle Ages. The lowlands that traverse the highlands to east and west became important thoroughfares in the thirteenth century and after, and contributed greatly to the development of towns and to the political importance of the Hessian Corridor. (See Fig. 54, pp. 324, 325 for early settlement.)

The area is lower in altitude than the highlands to east and west of it, but it is surmounted by the great volcanic massifs of the Vogelsberg and

the Rhön, that are drained northwards by the Fulda, with the Werra tributary on its eastern margin, and the Eder that drains eastwards from the Rhine Massif, while the Lahn and the Kinzig drain southwards to the lowland that leads to Frankfurt. The character of its relief and of its corridor function are revealed by the main physiographic elements that compose it. The main feature is the base of horizontal strata of Bunter sandstone that continue northwards into the Weser uplands and southwards into Franconia. The southeastern sector is the northerly continuation of the Franconian scarpland. Volcanicity has been a marked feature of the whole area. During the Middle Tertiary period most of the area was under water and shallow-water lignite deposits were formed, some of which have been preserved under the subsequent basalt flows. Still more recent earth movements account for its dominant relief features. These began with volcanicity, and were followed by faulting and uplift right into the glacial period. Two fault troughs and two intervening raised blocks trend north-northeast to south-southwest. These are known as the West Hesse Depression, the Vogelsberg-Meissner axis, the East Hesse Depression and the Spessart-Rhön axis. The two depressions consist of a series of separate depressions and form natural corridors from north to south. They have been of importance to man since the earliest times. They were followed by a close network of north-south routes during the Middle Ages, when probably they carried their greatest traffic, and they are both used today by the main railways. The western route passes from the Wetterau to Giessen and Marburg and then goes down the Eder to Kassel. The eastern route goes up the Kinzig through Hersfeld and Fulda and Bebra, thence down the Fulda to Kassel and on down the Leine trough north to Göttingen. The majority of the towns of Hesse came into being between 1200 and 1300, and almost all were founded on these main routes and frequently under the aegis of a castle.

Several types of relief are dominant in the area. The Bunter sandstones form undissected wooded plateaus (Terrain 12). The volcanic flows form plateau surfaces (Terrain 10). The depressions form gently rolling hills interrupted by steep-sided basalt hills. Isolated basalt hills occur south of the Diemel and between the Knull and Vogelsberg and again south of the Habichtswald. Valleys are broad and offer no obstacles to cultivation or movement. Deep narrow valleys and entrenched meanders and extensive plains are rare. Exceptions are the deep valley of the lower Fulda, the wide meanders of the Werra below Eschwege, and the fluvial plains on the Ohm and Schwalm around Wabern, Kassel, Bebra and Eschwege. (Fig. 117.)

The *Vogelsberg* is the greatest basaltic highland in Europe with an area of 2,000 sq. km. The edges of the basalt flows rise sharply from the

fertile open plains of the Wetterau, to which its streams flow radially from the highland. The base to the east, north and south is Bunter sandstone, and Tertiary deposits occur to the west. Residual basalt outliers form low steep-edged hills that rise above the plain as far as the Lahn, Main and Kinzig, and stretch, like bridges, to link up with the Rhön and the Knüll. Long gentle slopes rise from the margins to the highest points of the Oberwald (650–700 metres, Taufstein 722 metres) and its radial valleys are broad and shallow. But with increased altitude the climate becomes more severe, especially on the northeast and north slopes, and there is a difference of three weeks in the onset of spring between the centre and the periphery. Grain and orchards reach the lower lands as extensions from the Wetterau, although arable farming is displaced by grass and stock-raising in the meadowlands on the basaltic rocks. Towards the Oberwald, meadows become ever more dominant in fields that are enclosed by hedges or walls, and large areas have been planted with spruce in the valleys in recent years. The highest villages lie at 625–75 metres. Beech forest covers most of the Oberwald and these are the remnants of the forest that covered the whole of the highland before clearings took place in the Middle Ages. Small villages nestle in the shallow valleys. The Frankish farmstead of lower altitudes in the west is displaced in the Oberwald by a unit house of half-timber built on a basalt base. There is a little woodworking and quarrying. The small towns form two series, one encircling the upper Vogelsberg and the other encircling the whole massif, but all are very isolated and small.

The *Rhön* lies southeast of the Vogelsberg and is separated from it by the depression of the Fulda. It is a volcanic highland surrounded by horizontal Bunter sandstones and limestones (*Muschelkalk*). The basalt and phonolithic caps, 100 to 120 metres thick, form a smooth upland. To the south-east the highland drops steeply, but to the west and north its boundaries are indefinite, with many basaltic outliers, as in the Vorderrhön—many of which carry Iron Age camp sites—that is distinct from the higher portion of the Hohe Rhön. The sandy soils of the sandstone plateau are occupied by conifers, whereas the red marls (*Rötböden*) are the main cultivated tracts. The *Muschelkalk* is almost treeless and devoted to grain or grass. The basalt highland is covered with beech forest, while the flat surfaces are often covered by peat bog. For the whole of the Rhön, a quarter is arable, a third forested, and just over a third in grass. The area is predominantly rural and its economy is focused on cattle. The long cold winter gives time for domestic crafts in wood and in some measure flax-spinning. The small-holders with scattered strips of land depend not only on their farm produce and crafts, but also on the tourist industry, which is of growing importance, especially winter sports. Large compact villages lie in the valleys, whereas hamlets

and isolated farms dot the plateau up to a height of 750 metres. The summits form a real divide between north and south in economy, dialect and political divisions. This division is clearly evident in the Frankish settlement of the tenth century. The Rhön is oriented towards the East Hesse Depression to the north. (Pl. 24.)

The *East Hesse Depression* lies between the Vogelsberg-Knüll and the Rhön and is partly a wooded plateau and partly an open cultivated lowland that has been used as a routeway between Thuringia and the upper Rhine. Here began the very early missionary settlement from which Fulda grew, and the activity of the Church in furthering rural settlement is evidenced by the frequency of the suffix *zell*. The towns of Fulda and Hersfeld, although figuring large in German history, have remained small market towns. Underlying salt deposits were early mined in the valley of the Werra to the north as far back as the Carolingian era and salt-mines between Vacha and Salzhungen feed large potassium chloride plants.

The *Wetterau* is the northern continuation of the loess-covered lowland of the upper Rhine plain, that projects northwards to Giessen. It has the open, undulating aspect of all these areas, with its economy centred on wheat and sugar beet. The country is crossed by shallow valleys that drain to the Nidda river. These are strips of meadow covered with water in spring. Occasional residual volcanic hills rise above the plain, and these are often crowned by medieval castles.

From Neolithic times this area has been occupied by man and the rich grain-growing area was embraced by and protected by the Roman *limes*. The compactness of the villages, the fact that they are frequently surrounded by walls and the churches fortified, speak of the importance of this zone as a routeway in the past. The three-course system with compact villages is evident today in the small scattered strips. But there are also large estates (*Gutshöfe*). The main series of small towns that commanded the chief north-south routeway lie on the west at the edge of the Wetterau and the Taunus, each with a few thousand inhabitants, with their marketing activity a little enlivened here by industry and there by salt springs. Reichstadt Friedberg (11,000) is the chief of the series.

The *West Hesse Depression* is the northerly continuation of the Wetterau plain. This structural depression is alternatively described as the West Hesse Upland and Hill Country. It is marked by great diversity of relief and is the main axis of the whole province. Though linking the "rifts" of the upper Rhine and the Leine, it is higher, less continuous, and not so clearly defined as these two. Yet it is a most important link between them as a zone of relatively easy movement for man in which the relief offers no obstacles. It is predominantly lower in relief and cultivated, as opposed to the higher, wooded uplands to the east and west,

where even mining of copper and iron long since disappeared. In this purely agricultural zone, towns are situated at regular intervals on through routes but Kassel and Giessen are its only active urban centres. Giessen (43,000), with its medieval nucleus on a basalt hill surrounded by the marshy floors of the Lahn and its tributary, lies at the bend of the Lahn along whose valley a route runs westwards across the Rhine Plateau to Wetzlar. It is a university town (like Marburg) and has engineering and cigar industries. Kassel (212/128) had its nucleus on a limestone terrace on the west bank of the Fulda and was thus an important bridge point and route centre. It also owed its later development to the favours of the rulers of Hesse, who established their residence here and attracted many Huguenot craftsmen. It was to house these immigrants that the Oberneustadt was founded (in 1698). In the Prussian era, in the nineteenth century, it acquired new industries, especially the manufacture of locomotives. Kassel has been seriously damaged by bombing and its population in 1946 was only 128,000. About 60 per cent of its houses were damaged.

West of the trough is the forested sandstone plateau (Fig. 80). This is divided into two sectors by the Kellerwald, a projection of the Rhine Plateau. Along the border of the plateau a narrow lowland depression has been eroded in the Permian strata and this area is served by several small towns. North of the Eder the wooded sandstone plateau formed the *Land* of Waldeck. But the farmland of Kassel extends north to the Diemel and to Hofgeismar to the Warburger *Börde*, where there is arable limestone country with basaltic hills. (Fig. 117.)

The Central Upland between both depressions is a northerly continuation of the Vogelsberg but is lower than the latter and crossed by several railways. The *Knüll* is mainly a wooded sandstone plateau with basalt caps, the former covered with coniferous forest, the latter with beech forest. There is no industry here except for the working of unimportant lignite beds near Falkendorf and Homberg. The *Meissner*, north of the Fulda, and enclosed in the rectangle formed by the lower courses of the Fulda and the Werra, has a varied relief owing to the northwest to southeast strike of different rocks. Water-filled hollows, in which gypsum was formerly mined, and the numerous slag-heaps of the medieval mining activities, give a derelict appearance to much of this area. The Bunter sandstones of the Meissner are forested (beech). The ridge of the Wellenkalk of the Ringgau rises above the valley of the Werra. Through this varied relief is cut the valley of the Werra with Eschwege as its chief point.

CHAPTER 20

THE NORTH SEA PORTS: HAMBURG, BREMEN AND EMDEN

BOTH BANKS of the lower Elbe and Weser are bordered by green strips of flat marshland that are limited inland by the sharp edge of the sandy Geest. The Geest district known as the *Würster Heide* reaches the sea between the estuaries and separates the *Länder* of sea-marsh of Würsten and Hadeln. The marsh is raised near each river, and lower lying (even below sea-level) nearer to the foot of the Geest, where it is known as *Sietland*. It is farm land. The great dykes of the Elbe and Weser separate this land from the busy arteries of the two river estuaries. These are both tidal, the Elbe to Geesthacht, the Weser to the Bremer Wehr, so that both have a strong tidal scour, and, with due attention to dredging, the maintenance of dykes, buoys and lighthouses, both are accessible to ocean-going vessels. A number of small towns lie on the steep edge of the Geest at its junction with the Marsh, or at points where the river undercuts the sandy beds of the Geest so as to form low, but sharply defined, bluffs. Bremen was sited on a sandy dune and Hamburg on a small tongue of the sandy Geest. Both were historic cities. Both have become the chief ports of the modern Germany. The imports of Hamburg are about double its exports and its hinterland includes the industrial areas of the middle Elbe basin and Berlin. Bremen handles goods of high value and relatively small bulk (such as cotton, wool, grain and tobacco, that made up two-thirds of its imports in 1937), whereas Hamburg's traffic is exceedingly varied and far exceeds in bulk and value that of Bremen. While the Hamburg agglomeration embraces one and a half million people, Bremen had little more than a third of a million, and while, in the 'thirties, Hamburg had a half of the German shipping tonnage, Bremen had little more than one-quarter (pp. 527-533).

HAMBURG (Sheet 2, Fig. 85)

Medieval Development. The beginnings of Hamburg date from the establishment of a stronghold and church by Charles the Great on the site of a preceding place of refuge (*Fluchtborg*). This soon became the seat of the bishopric of Nordalbingien and then of the combined archbishopric of Hamburg and Bremen. Its importance extended still

further, for until the foundation of the archbishoprics of Lund, and Upsala in Sweden, Hamburg controlled the expansion of Christianity into that country, and in Norway until the foundation of the bishopric of Trondheim.

This initial fortified bishop's settlement did not lie on the Elbe and was not an Elbe crossing. It lay on the north bank of the river on a narrow tongue of raised, well-drained, sandy Geest between the small marshy valley of the Alster to the north and west, and the channel of the Bille to the south of it. (Fig. 86.) An old highway that followed the northern rim of the river plain came westwards to this site and then crossed the Alster at the point where its little valley narrowed to cut through the Geest (with a marshy lowland behind it). The marshes and river channels in the Elbe, that formed a belt eight to nine kilometres wide, could not be crossed for regular traffic. At this time the main Elbe crossing lay upstream at Lauenburg-Bardowick. Even in 1800 the Elbe was rarely crossed from Hamburg to Harburg. Road and railway from the south ended at Harburg, until the bridges were constructed over the Süder- and Nordelbe in 1872. It is not surprising, therefore, that Lauenburg and Bardowick were more important places in the early Middle Ages. Moreover, with the eastward movement of the front of German settlement beyond the lower Elbe and the growth of ports on the Baltic shores, pride of position was held by Lübeck, and Hamburg was a minor feeder to Lübeck. The bishop's settlement clustered around the cathedral and St. Peter's church on the Geest spur.

The development of Hamburg as a port commenced at the end of the twelfth century. A certain noble named Wirad was allowed to build a stronghold on the Alstermarschinsel, next to the bishop's settlement, and here clustered merchants and seamen, around the St. Nicholas and Catherine churches. In 1228 the two settlements were merged into one. At this time Hamburg was given the monopoly of trade and navigation on the Elbe to the sea, as well as privileges of markets and self-government. At the same time, Henry the Lion destroyed Bardowick and founded Lübeck (1189) (Fig. 87).

The development of the port of Hamburg involved the transformation of the natural landscape. Drainage and dyking of the marsh above Hamburg commenced in the late twelfth century. Dyked villages appeared along the raised land of the Wärdar nearer the river and not on the more distant peripheral bog areas. At an early date, groups amalgamated in their common struggle against the water. The district of Vierlande emerged in this way during the thirteenth century, through the grouping of four such communities. The marsh of the present area of greater Hamburg, that covers 15 km. in length and 8 km. in width, was settled in its higher parts, but for the most part remained economically worthless.

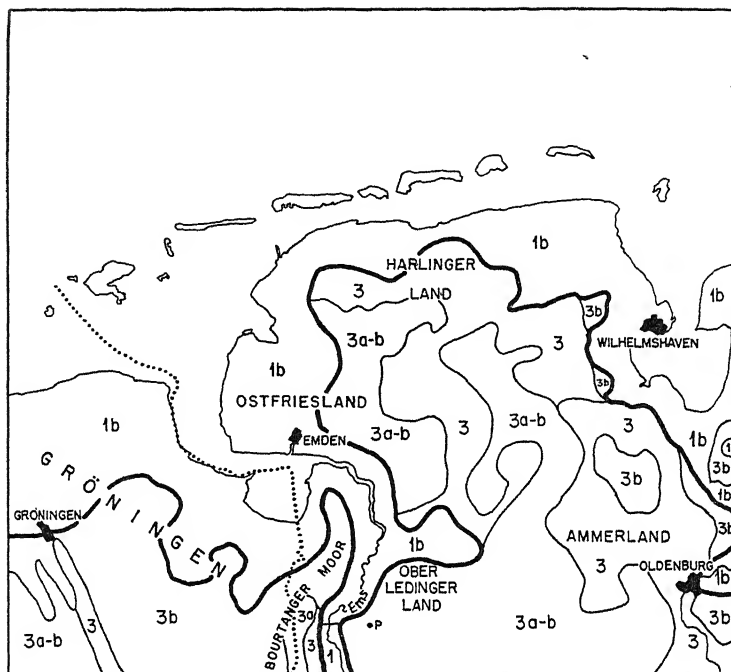


FIG. 84—TERRAINS AND REGIONS: Sheet 1. EAST FRIESLAND-OLDENBURG

Fig. 84. Sheet 1 covers much of the lowland of northwestern Germany, with its combination of

- | | |
|---|---|
| (i) Coastal reclaimed marshes (German <i>Marschen</i> , Dutch <i>Polder</i>) | (iii) Low-lying bogs (<i>Moor</i>) |
| (ii) Flat, alluvial river plains | (iv) Raised, dry, sandy heath and wooded lands (<i>Geest</i>) |

Fig. 85. Sheet 2 covers the continuation of the country on Sheet 1 (p. 518) to the Elbe river. North of the Elbe lies the peninsula of Schleswig-Holstein, between the North and Baltic seas. It has a width of 50-100 km. and a north-south belting of:

- | | |
|---|--|
| (i) <i>Marschen</i> in the west | (iii) Undulating cultivated land, developed on terminal and ground moraines in the east. |
| (ii) <i>Geest</i> and <i>Moor</i> in the centre | |

1. *Alluvial Plains*. Plains of clay or loam, liable to flood. Meadow and coppice, cultivated in certain valleys. Villages on or near the river banks or at the edge of the river plain (e.g. the Weser).

1a. *Drained Marsh or Polder (Marschen or Koog)*. Flat, near or below sea-level. Heavy clay soil. Close network of drainage ditches. Mainly under meadow. No woods. Small villages, with farms strung along roads and canals.

2. *Flat or Undulating Land: Clay or Loam*. Grass and/or arable, woods. Mixed open arable and hedged fields. Villages and isolated farms. Numerous copses and sunken tracks.

2a. *Undulating or Hummocky Land with marsh-bordered lakes*. Average altitude 30-50 m. Shallow lakes and bog hollows. Heavy loam soil. Over half the total area under arable cultivation (grain and fodder crops). Hedged fields, copses, and woods, in the northeast corner of the sheet where it merges into a main area of this type on the adjacent sheet.

3. *Low Plateau of Sand and Gravel (50-80 m. thick): Sandy Geest (Heath)*.
[Continued over on page 521]

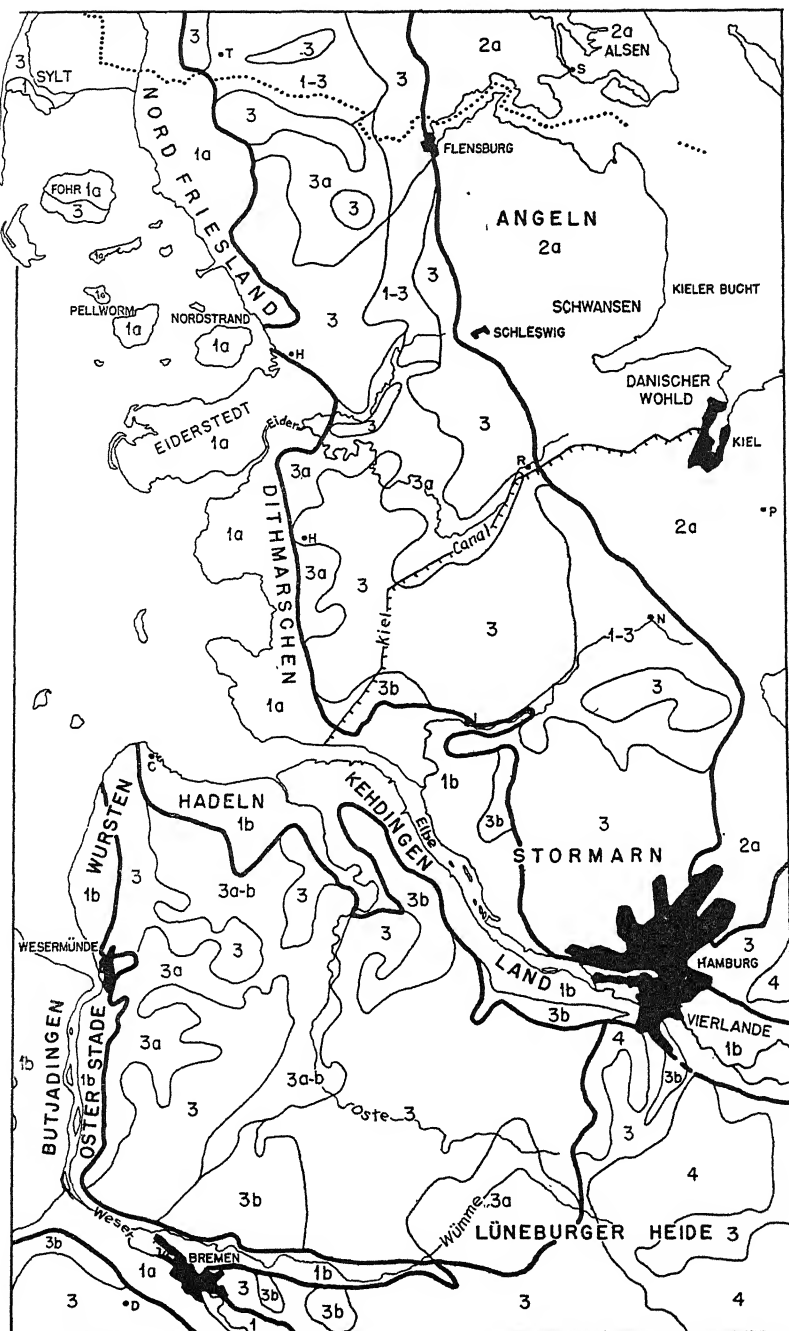


Fig. 85—TERRAINS AND REGIONS: Sheet 2. SCHLESWIG-HOLSTEIN AND HAMBURG

The various nuclei grew through the common task of drainage and dyking, especially in the eastern section, that received the name of Wilhelmsburg after the duke of Lüneburg. The main islands finally became the property of Hamburg by purchase from the kings of Denmark in 1768.

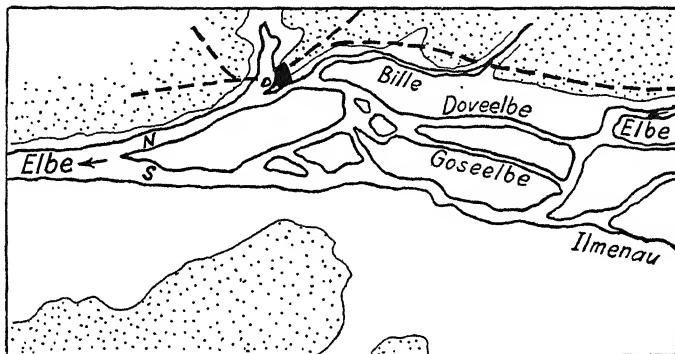


FIG. 86—THE SITE OF HAMBURG (*from Lütgen*) (scale, 1 : 600,000)

Stippled area is Geest, the remainder is Marsh. The dashed line shows the old road on the north bank of the river. The Elbe and its distributaries between Geesthacht and Blankenese are shown as of A.D. 1100.

N = North Elbe

S = South Elbe

Medieval Hamburg grew in importance, though it was overshadowed by Lübeck and had another competitor in Lüneburg. It traded the products of its own crafts and exported beer, linen, salt and corn. It became an influential member of the Hanseatic League and was responsible for the suppression of piracy on the North Sea. The population about 1600 was over 10,000 and in 1620-6 the Altstadt was strongly fortified with walls, ditches and towers in accordance with the needs of the new warfare. It was able to survive the Thirty Years' War and resisted a long siege by Denmark, until the Elector of Prussia came to its relief. Denmark sought to control the exits of the Elbe, but finally relinquished her claims and surrendered to Hamburg the fortress town of Gluckstadt that had been founded on the lower Elbe to overawe Hamburg and levy toll on the Elbe traffic.

Hamburg's control over the Elbe estuary increased as against the competitive powers whose territories reached its shores. In 1246 it obtained control of an island and established a lighthouse there and the great stone tower that was erected in 1372 is the oldest lighthouse still in use in the world. In 1393 the Wasserburg of Ritzlerbüttel, the base of the sea-robbers, was taken by force and then formed the base of extension in the estuary mouth. In 1673 Hamburg obtained permission from the duke of Holstein to erect a lighthouse on the island of Heligo-

land. At the end of the fifteenth century the city obtained control of the southern channel and diverted the waters northwards to the main channel and kept watch on the river to oblige ships to take the more northerly course by the city. In this way, the development of new port facilities on the south bank was prohibited. Efforts of Hanover in the eighteenth century to establish the port of Harburg failed. Even Stade further downstream was unable to acquire any trade. Hamburg's aim was to concentrate traffic in the northern channel so as fully to exploit its ancient guaranteed monopoly of the river-borne trade of the Elbe.

The original harbour on the lower Alster soon suffered from silting, for the stream was dammed so as to use the water to drive the grist mills. This dam converted the Alster into an inland lake, divided by the Lombardo bridge into two parts, the Binnenalster and the much larger Aussenalster. To offset this the Bille stream was diverted northwest to the Alster (along the line of the present Oberhafen and Zollcanal) along what was probably an old overflow channel. The harbour was shifted to the mouth of the Bille (Brook) on the site of the present Binnenhafen. This took place in the mid-thirteenth century. Later extension in the sixteenth century was downstream to the Niederhafen, which was the first harbour to be developed alongside the main stream of the Elbe. The improvement of the river course began after the Thirty Years' War, when ships quickly became larger with the growth of overseas trade. A main barrier was the Blankenese bar at the junction of the north and south branches of the Elbe. The single channel was dredged in the mid-seventeenth century to concentrate the flow, and the depth of the channel was gradually increased from four to ten metres, so that today the largest vessels afloat can navigate the estuary to Hamburg.

Modern Development. Hamburg became a leading port in the seventeenth and eighteenth centuries and for decades after 1650 it was the largest city in Germany, for it had in large measure taken over the commercial functions of Antwerp. The Hamburg Bank was founded in 1619, and the manufacture of sugar from imported supplies developed in this

Fig. 85 (*continued*)

Over about 30-40 m. altitude, seldom above 80 m., though low closely undulating hills reach 100-150 m. Little surface water. Heath, extensive pine plantations, oak woods, but frequently interrupted by areas of low-lying bog (see 3a below). Typical village grouped around small open arable area (*Esch*) with hedged and fenced fields and isolated farms around it (*Kampensiedlung*).

3a. *Low Plateau of Sand and Gravel: Moor (Bog or Fen).* Low-lying, below about 35-40 m. altitude. Water-table near surface, peat with sphagnum moss and cotton grass (*Hochmoor* or bog). At lower levels, swamp and shallow lakes with sedge mosses (*Flachmoor* or Fen).

3b. *Low Plateau of Sand and Gravel: Reclaimed Bog.* Peat cuttings, lands cultivated with canals and ditches, and farms strung along roads and canals (*Fehnkolonien*).

4. *Low Plateau of Sands and Gravel: Sandy Geest Forested.* Conifer plantations, some open oak woods, heath.

Note. Heavy lines show boundaries of the major physical units (Fig. 13).

period. In 1665 the first German chamber of commerce was founded here. Trade increased with North America and exports of Westphalian and Silesian linen increased. It participated in the whaling of Greenland, out of which developed the soap industry. In 1800, 2,000 vessels used the harbour with a total tonnage of 150,000 tons. It was during this period (1650-1830) that the Neustadt was developed west of the Altstadt, beyond the Alster valley (5 and 6 on Fig. 87).

Serious injury was suffered through the blockade of the Napoleonic wars. The population sank from 150,000 to 100,000. But revival was rapid in the early nineteenth century. Commercial treaties were signed with Brazil and other South American states. Trade also grew with the South Seas, particularly by the great house of J. G. Godefroy. Two other firms developed trade with East and West Africa.

In 1816 the first steamships entered the Elbe, and from then on the rapid increase in the size and number of ships called for ever bigger harbour facilities. These were erected for the most part on the low-lying islands of the river estuary that lay opposite and below Hamburg on the north side of the river. Plans were retarded by the problem of choice between open docks or enclosed docks. The average tidal range is two metres but can be four times as much during stormy weather or high tides. There is an important difference also between the average duration of the high tide of four and three-quarter hours and the longer ebb tide of seven hours. At first English experts were consulted, but the docks of English ports were built so as to accommodate a tidal range of six metres in London and even eight metres in Liverpool. And this was seen to be ill-suited to the special conditions of Hamburg. Moreover, much of the activity of Hamburg is transshipment from ocean vessel to river barge. (Only a half of the inland goods traffic is transferred from ship to rail. The bulk of the cargo is transferred from sea-vessel to river barge.) Open quays, it was realized, were better suited to this traffic, provided that they were high enough to permit their use at all states of the tide.

The Grosse Grasbrook and Sandtor wharves were chosen in the 'sixties as the first new installation, each being provided with quays, railway, and road (Fig. 87, south of 4). Meanwhile, the new German Reich was established, and Hamburg experienced another period of prosperity. The population in 1866 was 260,000 and increased to 570,000 in 1890. In 1881 Hamburg entered the German customs union, with the exception of the Free Harbour, to and from which goods were conveyed without payment of dues. The northern Brook and the homes of its 20,000 people were cleared to make room for the new free port. The Baakenhafen was an eastward extension, twice as large as the other two together. With this extension the possibilities of the north bank adjacent to

the town were exhausted and now future developments turned to the south bank. This change altered the whole layout of the Hamburg port and set a number of great problems of urban development for the whole agglomeration.

Communications across the estuary south from Hamburg developed very late. A cart ferry was established in 1851 to Wilhelmsburg and thence to Harburg. Not until Hanover fell to Prussia was the question of a bridge discussed across the north and south Elbe. Between 1868 and 1872 the first bridge was built a little above the Baakenhafen. This put a stop to the upstream expansion of the port, which thus had of necessity to expand across and down the river. The development of the modern port in this direction completely separated the area of work, the port, and the area of residence, the town, and this gave rise to the persistent problem of providing adequate communications between the main living area north of the river and the main working area in the port and industrial areas on the south side of the river. These difficulties are aggravated by mist and ice in the winter and the problem of tunnels under and bridges over the river.

This extension of the port involved the erection of quays raised sufficiently high to cope with vessels at all states of the tide, warehouses, and railway and road connections. The first extension lay between the Harburg railway and the Reiherstieg directly south of the city. This section was built between 1888 and 1895 (100 acres). This area reached southwards to the frontier of the city-state, beyond which extension could not take place. Moreover, industry and ship-building yards had already taken up the land along the Reiherstieg. So that when new facilities were required, with better equipment to accommodate the ever-growing size of the ocean liners, extension had to take place further downstream opposite Altona beyond the channel called the Köhlbrand and still further from Hamburg. Thus, this whole area has been transformed to a modern port with an area of 25 square miles, with 23 harbours and a water area of 1,250 acres and nearly 35 miles of wharves, and 1,000 acres of river harbours. The urban area extended widely on the north bank of the river, as shown in Fig. 87.

Extension also took place at the mouth of the estuary. Cuxhaven lay on the south side of the main channel and was early acquired by Hamburg in its struggle against the sea-robbers. This place was unimportant, however, until the middle of the nineteenth century when an artificial harbour was made by dredging. This was first used as a fishing port, but, towards the end of the century, it began to be used by the large passenger liners to New York, and in the last forty years its facilities have been greatly increased as a free harbour. It is also a bathing resort and the port for connections with Helgoland (population, 1933, 42,000).

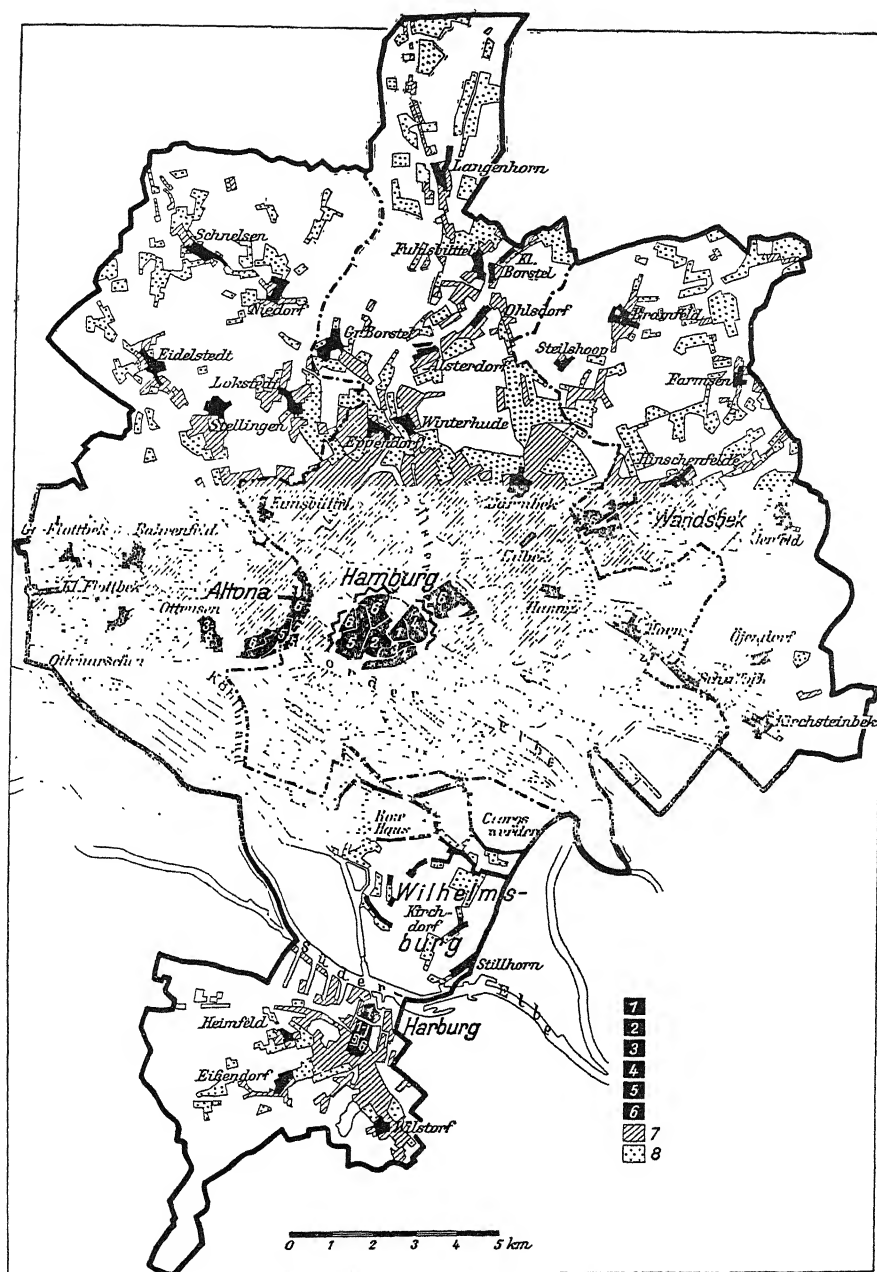
The general features of the *growth of modern Hamburg* are shown in Fig. 87.

The Alster divides the Altstadt in the east from the Neustadt in the west. These two together formed the Innere Stadt that was surrounded by a single line of fortifications in 1620-6. The latter stands out clearly in the modern plan as the green belt on the west and is occupied by the railway tracks on the east. Around this nucleus are disposed the inner *Vorstädte* that grew in the seventeenth to eighteenth centuries and beyond these lie the outer suburbs (*Vororte*) that grew in the nineteenth to twentieth centuries. To the latter must be added the separate towns of Altona in the west and Wandsbeck in the east. Suburban extensions reach west beyond the Alstersee, beyond the city-state boundary to Langenhorn.

Five churches, each over 100 metres high, are the main nuclei of the inner bishop's city—St. Peter, Jacob, Nicholas and Catherine in the *Altstadt*, and St. Michael in the *Neustadt*. This nucleus changed steadily during the last hundred years, at an accelerating speed, partly owing to the great fire of 1842, and especially to the development of business, to form the central business section. Old streets and multi-storied merchants' houses with gables facing the streets and warehouses in their top stories with pulleys from their windows appeared in parts of the Altstadt. Slums were cleared and great modern multi-storied buildings and street widenings erected on their sites. Monotonous blocks of tenements with high population densities characterize the nineteenth-century extensions and amusement establishments extended westwards along the avenue called the Reeperbahn, the Broadway of Hamburg.

The sharp separation of the city and the harbour by the great width of the river have given rise to two sets of problems, one a settlement and a traffic problem and the other a problem of the administration of the port as a whole.

In the 'thirties about 100,000 people worked in the port and about another 50,000 who were so employed but lived outside Hamburg. Population was thus congested within the frontiers of the city. The clearance of old quarters after the cholera epidemic of 1892 and the growth of business buildings in place of houses caused tens of thousands of people to shift outwards from the central zone. Fortunately, the Geest land to the north and northeast was at first available for building, but this was quickly built up by the homes of port workers as well as for city workers. In 1925 37,000 workers lived in the business centre, whereas 125,000 worked there, so that in the business centre and the port area combined there were about 225,000 Hamburgers who earned their living there, but less than a fifth of them lived there. Population had grown so much that the whole of the city area was built up right up to its limits

FIG. 87—THE GROWTH OF HAMBURG (*from A. f. L.*) (scale, 1 : 100,000)

- | | | | |
|---------------|---------|---------|---------------|
| 1. About 1150 | 3. 1250 | 5. 1650 | 7. 1900 |
| 2. 1200 | 4. 1550 | 6. 1830 | 8. After 1900 |

and there was not even room for cemeteries, so that many people had to be buried across the city boundary in Prussian territory.

The political disintegration on the lower Elbe aggravated the whole problem of housing and traffic, as well as that of the organization and administration of the harbour.¹ The interests of Hamburg and Prussia on the Elbe were sharply opposed, for Prussia wished to derive as much advantage as possible from the development of commerce on its shores. Furthermore, the Prussian territory on the lower Elbe contained parts of two provinces that included three *Regierungsbezirke*, several towns and rural districts (*Landkreise*), and all was not accord between them. Various plans to resolve this impasse were put forward after World War I. One proposed a Lower Elbe State that would have had its boundaries at the head of the small left- and right-bank tributaries. Another was a Gross-Hamburg plan, for an area from Geesthacht to Stade, that would have included Altona, Harburg, Wilhelmsburg and Wandsbek. But these schemes were abortive.

The first steps to regularize this situation were economic. Insurance companies insisted on common aid in fire-fighting. Labour in the whole harbour area is unsteady and often casual. Weather stops work, ships leave or arrive as far as possible on Saturday or Monday so as to avoid a day of inactivity in port. Jobs are often short and workers shift from the wharf of one firm to another. Mobility of labour is obtained by co-operation throughout the harbour area. In 1929 Hamburg and Prussia came to an agreement regarding the housing question and on the organization of the port and its future extensions. The most important step in the territorial reorganization of the urban complex of the lower Elbe was taken in 1946 by a decree of the Nazi Government, whereby the whole complex was amalgamated to form one great administrative unit called Hansestadt Hamburg. This is the political area of the Land Hamburg now under the British post-war occupation. It is the area shown on Fig. 87.

In 1939 this Hansestadt Hamburg had 1,712,000 inhabitants. It suffered dreadfully from bombing, but the total population in 1946

¹ The sort of difficulties that arose may be illustrated by examples. While a fire raged on the harbour of Wilhelmsburg the Hamburg fire engines waited inactively on the frontier of the town until special permission had been given for them to cross. One authority forbade night lighting on the Elbe, another allowed it, the result was more than one collision of ships. Traffic laws in the harbour differed from one authority to another. The neighbouring fish markets of Hamburg and Altona competed with each other. Altona had no space for the building of a harbour on its own territory and the land across the river belonged to Hamburg, and here Hamburg built its harbour. At great cost, and in competition with the port of Hamburg, Prussia erected installations next to those in Hamburg for the handling of bulk cargoes after Hamburg had decided not to bridge the Köhlbacken. Hamburg had good drinking water derived from deep wells, but these for geological reasons are not available to Altona which has to draw water from the Elbe, which is impure and must be purified, since Hamburg dumps its sewage in the river just outside the Altona boundary. There were also many awkward breaks in transport facilities.

reached 1,403,000. Much of the harbour—its wharves, warehouses, cranes and ship-building and industrial establishments—is in ruins. Enormous tracts of the inner residential areas are laid flat. One-half of all the houses were destroyed. But marked steps in revival have taken place. Some plants have been dismantled, but wharves and warehouses are being erected by the port authority. Though the great entrepôt trade that was such an important feature of Hamburg's trade is gone, the general cargo trade is almost up to its pre-war level.

BREMEN (Sheet 2, Fig. 85)

Site and Development. Bremen lies on the lower Weser about 80 km. upstream from Bremerhaven (Fig. 88). The marshy floor of the Weser commences about twenty-five kilometres above Bremen at the confluence of the river Aller. Over these flat marshy lands, with their heavy clay soils, the tides formerly ebbed and flowed. The width of this former flood plain at Bremen is 150 metres, at Vegesack 200 metres, at Brake 900 metres, and at Bremerhaven 1,500 metres. Before the area was dyked and the flow of the river regulated, the only settlements were isolated farms situated on mounds (*Wurten*) raised slightly above sea-level. Much of it is below sea-level at Bremen and the Weser and its tributaries are dyked. Large tracts of water-covered land are to be seen at times of high water, especially in winter. This marsh belt is bordered to the north and south by higher drier land, built of sands and gravels and often covered with heath (*Geest*). Often the Geest drops by steep bluffs to the marsh; this is especially the case where the north bank of the river impinges, below Bremen, on the Geest.

Bremen lies on the north bank of the Weser in the middle of the belt of marshland—unlike Hamburg which was sited on the Geest where it reached the bank of the Elbe. The town itself lies on a low sand dune running northwest to southeast that lay above flood level and in A.D. 787 was selected as the site of a bishopric. Here, 11.4 metres above sea-level, was erected the first wooden church at the only crossing place of the lower Weser on the routeway from the Rhinelands to the lower Elbe and the Baltic shores.

Early commercial development was favoured by the two routes that crossed the Weser—one from the northwest via Oldenburg, the other from the southwest via Osnabrück. On the east side of the river, routes ran northeast to Hamburg and southeast to Verden. A bridge must have been built early but the first record is 1244 and a hundred communities around had to help in its upkeep. Unlike Hamburg, Bremen was an important river crossing. In 950, varied rights were granted to the bishops by the Emperor—tolls, mint, law and *bann*. A wall was also built at

this time around the cathedral immunity. There soon followed a settlement of traders and craftsmen around the cathedral quarter, between it and the river. The trading colony lay on the south side of the bishop's city and north of it was the craftsmen's settlement (*Stefansviertel*). An all-embracing wall was built in 1305. The risings of this ancient urban settlement against the bishop's powers resulted in the acquisition of full self-government with a town council in 1225. The town finally joined the Hanseatic League at the late date of 1358. Extensions in the later Middle Ages took place on the long narrow peninsula between the Weser and its distributary; and in the Neustadt, founded in 1625, on the south side of the river, the latter with a rectangular street pattern. A new wall, embracing the Neustadt, was completed in 1625 as a protection during the Thirty Years' War. In 1731 Bremen was recognized by Sweden as a free *Reichstadt* (already acceded in 1648) and reaffirmed in 1815. In the seventeenth and eighteenth centuries some extension of the built-up area outside the walls took place, especially to the northwest and southeast on the higher land of the dune and parallel to the Weser. In 1806 Bremen had 35,000 people and was still an insignificant port as compared with Hamburg, a fact that was mainly due to the inferiority of the Weser for navigation.

Development came with the fall of Napoleon, but drawbacks were the lack of adequate navigable waterways connecting it with the interior, the small population of its immediate surroundings (less than one million people today live within a radius of fifty kilometres of the city), and the difficulties of navigation of the long river channel below the city. Already in the seventeenth century sea-going vessels could not reach Bremen itself. Bremen established its first outpost at Vegesack, seventeen kilometres downstream. But this was not enough and ships had to berth at Elsfleth, and then at Brake, where goods were transferred to barges and carried up to Bremen. With the development of overseas trade, especially with America, in the early nineteenth century, Bremen saw itself threatened with decline, but its enterprising Burgermeister, Johann Schmidt, effected in 1827 the purchase of land at the mouth of the Geeste stream and here was established Bremerhaven. Bremen's overseas trade then developed rapidly and handled most of the vast emigrant traffic to the United States. In 1844, 1,774 emigrants left Hamburg as compared with 20,000 from Bremen. Returning ships brought American goods back, for which Bremen became the chief market; the two chief were cotton and tobacco. The first American steamship line was attracted to Bremen by offers by Schmidt of freedom from harbour dues and the tax-free loading of coal (1839). This arrangement expired after ten years and in 1857 the Norddeutsche Lloyd steamship company was established in Bremen, in imitation of the Hapag concern that had been established

in Hamburg a few years previously (1847). In 1870, though exceeded in shipping tonnage by Hamburg, Bremen was on a level with Stettin.

The separation of outpost (Bremerhaven) and headquarters (Bremen) by seventy kilometres led to many difficulties. The Weser also was becoming too shallow for the increased size of lighter craft. The lower Weser had to be made into a channel suitable for sea-going vessels. Plans to this end were made with the states on the shores of the estuary before the Franco-German war, and in 1874 final plans were arranged between Bremen, Prussia, Oldenburg and the Reich. A Bremen engineer worked at the plan in the 'seventies and the channel was deepened, regularized and dyked (begun in 1887-8) so that vessels of 4-5,000 tons could reach the city on one tide. In 1884 Bremen joined the German customs union and acquired a Free Harbour. Following on this came the construction of the new harbour.

In 1850 shipping was shifted from alongside the Altstadt to the lower end of the town. In 1874 an extension (*Sicherheitshafen*) was built on a part of the old fortifications. But the demands of the new navigation demanded an entirely new site for shipping facilities. Hitherto the port facilities of the 'seventies lay on the left bank of the Weser immediately below the railway bridge near the Neustadt. Now a new site was chosen on the right bank below the town. In 1888, the Freihafen I was opened, followed in 1891 and 1906 by Freihafen II and III respectively.

Great strides were made after 1906. Vessels that came up to Bremen were increasing in size and draught (8,000 tons with a depth of eight metres became common), but ships with a draught of seven metres caused difficulties in navigating the lower Weser, so that two-thirds of the ocean-going vessels could not get up to the city harbour. The river was then still further improved, so that ships with a draught of eight metres and up to 12,000 tons could reach Bremen on one tide.

New extensions were planned before the 1914-18 war. Large open areas in the marsh were available on the south side of the river opposite the existing new harbour, but this would have involved, as at Hamburg, great expenses of bridging and tunnelling the river. So large areas were chosen on the north bank of the river adjacent to the existing harbour (*Wendehafen*). The left-bank marshes were reserved for future expansion. The chief of the outer harbours was separated from the river by locks. Bremerhaven, it may be noted, was provided with a large new harbour with locks and dry docks, since the tidal range is higher here than at Bremen.

The development of traffic on the lower Weser has thus resulted in the growth of several different small ports—Vegesack, Blumenthal, Elsfleth, Brake, Nordenham and Oldenburg, the last being connected by canal with the Weser. In the last decades of the nineteenth century Lloyds

berthed their largest vessels at Nordenham. Here, too, are the oil-storage tanks of the German-American Oil Company and a refinery, cable works and fishing concerns. Wesermünde (or Bremerhaven) dominates the Weser estuary. This urban area combines Bremerhaven and Wesermünde, that lie at the mouth of the small Geeste stream on the right bank of the Weser estuary. Bremerhaven, the outport of Bremen, can accommodate the largest vessels and is the outport of Bremen; it has about 25,000 inhabitants. Geestemünde was founded in 1857 by the king of Hanover on the south side of the Geeste as a rival to Bremerhaven on the north side. This it never succeeded in doing, but has become the biggest fishing port in Germany, and has about 75,000 inhabitants. Bremerhaven is an exclave of Bremen, surrounded by Prussian territory. The two neighbours now work in close harmony and together have a population of about 100,000 (100/111).

The industries in Bremen are closely associated with the trade of the port. They include shipping, milling, woollen textiles, iron smelting, oil refining, the manufacture of foods (coffee, chocolate, sugar, beer). After 1920 it greatly developed its passenger traffic and built the *Bremen*, *Europa* and *Columbus* liners. The chief imports are cotton, wool and grain. Of lesser importance are yarns, skins, metals, oil seeds, tobacco, coffee. Exports, making a third in value of the exports, are normally metal wares, machinery, metals and cloths.

Bremen is largely dependent on its canal connections with the Ruhr, for the upper Weser basin has few products to offer for export and is thinly peopled with a small demand for imported goods. But Bremen, unlike Hamburg, depends primarily on rail transport for its exports and imports to and from its hinterland. Eighty-five per cent of the goods shipped to Bremen from inland arrive by rail or road, and only 15 per cent by water (cf. Hamburg, 40 per cent by rail and 60 per cent by water). This predominance of rail transport is evident in the great area taken up by railway tracks in the port complex, where there are 300 km. of track as compared with 40 km. of quays. This is in marked contrast to Hamburg, where shipping facilities are much more extensive and varied.

The Growth of Bremen (Fig. 88). The built-up area extends from Vegesack (N.W.) to Hemelingen (S.E.) and the line of settlement is continued in the settlements on the edge of the Geest beyond Vegesack and by the continuous chain of villages along the road and rail that stretches to the southeast. The limits of Bremen cannot be fixed by building alone for surrounding villages are drawn into its orbit of influence, housing Bremen workers and sending in milk and vegetables to feed the townsfolk. The influence of Bremen extends beyond the immediate sphere of these contiguous villages. Blumenthal, Delmenhorst and Hemelingen are industrial satellites. The last developed its industry at a time when Bremen

joined the German customs union (before 1888), and industry located just southeast of the city on Reich territory. Within a radius of ten kilometres of the town hall there are only 350,000 inhabitants, and 500,000 within twenty-five kilometres, the town itself having just over 300,000 of this total.

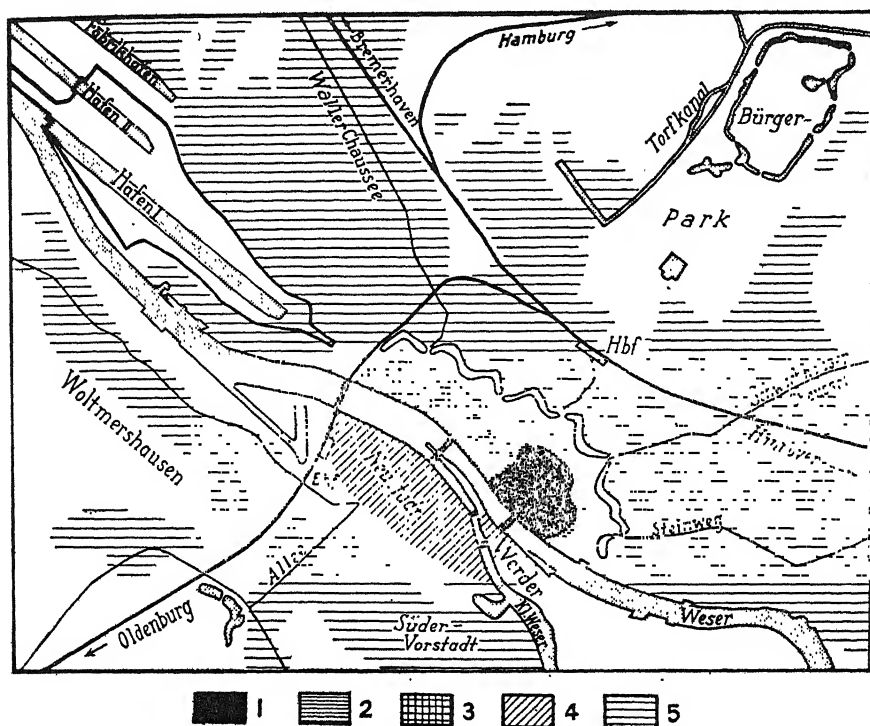


FIG. 88—THE GROWTH OF BREMEN (from Braun) (scale, 1 : 60,000)

- | | |
|--|-------------------------|
| 1. Town nucleus with cathedral,
A.D. 1000 | 3. Stefansstadt in 1300 |
| 2. Extension in 1200 | 4. Neustadt in 1615 |
| | 5. Modern growth |

In the build of the city the most outstanding feature is the well-preserved green belt on the site of the *Wall* and *Graben* that form a belt of open spaces right around the *Altstadt* on the right bank of the river. Two sectors are recognizable in the *Altstadt*. The one is an oval-shaped area at the eastern end with a cluster of irregular blocks grouped around the cathedral. On the northwestern border of this nucleus is the market place around which are clustered the chief public buildings—Schutting, Rathaus, Exchange and Cotton Exchange. Northwest from it there runs a long wide street, the axis of the medieval town along the top of the low, whale-backed ridge (*Oberstrasse*) and, parallel to it nearer the river, there

is a second narrower street (Langenstrasse). Old buildings have narrow street frontages with several stories and steep gables with large entrance halls (*Diele*). Warehouses lie on the river front with narrow winding streets running at right angles to the main streets towards the river. Among all the buildings of administration and business in this district there stand out those of the Norddeutsche Lloyd and the Cotton Exchange, that reflect the importance of the overseas passenger and cotton trade in the life of the city. The Neustadt, founded in the early seventeenth century, has regular streets and rows of single-story houses.

The zone immediately beyond the green belt, with narrow winding streets and old houses, has much in common with the Altstadt. But, further out, there are large areas of regular streets with rows of two-story houses with gardens and rows of flats, instead of the old brick-built houses with steep gables and two stories (for the single family) and several stories (in the merchants' houses) that occur in the *Altstadt*. In the outer areas there occur flatter roofs and plaster frontages with small gardens in the better-class houses, and rows of small, squat, single-story houses with gardens in the poorer quarters. Tenements, though insignificant as compared with other German cities, have increased, but since the 1914-18 war the single-family house with one story and attic has been the dominant kind of building. The predominance of the small single-family house is thus a marked feature of Bremen as opposed to other German cities.

The harbour begins immediately below the railway bridge (inland river barges lay up on the quay in the inner town) at the quay by the Weserbahnhof, where lighters load and unload goods and passengers to and from the outport of Bremerhaven. Directly opposite is the Hohen-torshafen, used for the unloading of timber; this is the oldest of Bremen's harbours and is the only one on the south side of the river. The Free Harbours are the nucleus of the port. Each is accompanied by continuous lines of sheds and numerous railway tracks. Freihafen I deals mainly with European traffic, Freihafen II with world traffic. The whole of the gigantic equipment is designed for the transfer from ship to rail or to storage sheds or warehouses. The timber and industrial harbour is taken up on its southern side almost exclusively by storage yards for timber, while factories, as noted above, line the northern side. These Outer Harbours, numbered from A to G, are separated from the river by locks, and so differ from the free harbours which are open to the river. They have few buildings and are mainly used for bulky commodities—timber, iron, coal and potash.

As in other cities, the centre loses population while the outer areas grow. In 1925 the Altstadt had 4,000 dwellings with 14,500 inhabitants as compared with 77,000 dwellings and 285,500 inhabitants in the city

as a whole. For the city as a whole there were two structurally separate dwellings and eight persons per building. This compares with 10.3 dwellings and 38 persons per building in Breslau, 8.7 and 29.3 in Berlin, 7.2 and 28.3 in Hamburg, 6.8 and 26.3 in Leipzig, 6.7 and 25.3 in Munich and 3.7 and 14.3 in Cologne. This indicates a distinct feature of the residential build of Bremen, namely, the dominance of the single-family house as opposed to the tenement. Small buildings with one to four dwelling units made up 97 per cent of all buildings, as compared with 49 per cent in Hanover, 38.4 per cent in Hamburg and 32.8 per cent in Berlin.

The total population reached 450,000 in 1939. A half of its homes have been destroyed, yet the population in 1946 reached 385,000. Selected as the outlet for the American Zone of southern Germany, the port has experienced a revival of its general cargo trade, and it retains that close connection with the United States that was such a feature of its modern growth. In 1947 the tonnage of the port, together with Bremerhaven, reached 8.7 million tons, as compared with 6 million tons for Hamburg.

EMDEN (Sheet 1, Fig. 84)

Emden is the most northwesterly harbour of Germany, and differs from Bremen and Hamburg in that it was directly in the control of Prussia, whereas the other two have been independent free cities in the German Reich. It was to the interest of Prussia to foster the development of this port. The frontier runs down the middle of the estuary of the Ems, and north to south parallel to and a few miles west of the river Ems. Much of the land that lies immediately around and south of Emden is poverty-stricken marsh, bog and heath (Fig. 84). Its potential hinterland lies beyond this area further south in the Rhinelands, especially in the Ruhr area. The problem of the modern development of Emden as a port has been to provide adequate transport facilities in competition with the Rhine ports of Holland and Belgium, and with Bremen and Hamburg.

The growth of Emden has been particularly closely associated with the *Geest* and *Marsch* land of Ost Friesland that lies immediately north and east of Emden between the lower Ems and the Jade Bay. The old small harbour of Eden developed to serve it. It was located on the northern side of the estuary of the Ems in a sheltered position along a coast that was generally difficult of access. The Dollart was formed in historic times and it is traversed in the north by the Ems. The tidal scour of the estuary kept the old channel free for vessels going to and from the North Sea.

There was a settlement on the site in 1300. It was a seat of sea pirates,

whose activities were connived at and even encouraged by the rulers of Ost Friesland, and one of their chief activities was to prey on the vessels that plied to and from Hamburg. The city of Hamburg in 1433 attacked Emden and Friesland by sea, and destroyed the castles in East Friesland and defeated the sea robbers in a sea battle at the mouth of the Ems. Hamburg thereby became master of East Friesland for twenty years. though thereafter the land was returned to the lords of the country. These lords procured for Emden in 1494 from the Emperor the rights of staple monopoly of the English and Dutch trade, an essential beginning in the Middle Ages for the growth of a trading centre. Prosperity followed with an immigration of settlers from Holland. Herring fishing and whaling also contributed to this period of prosperity in the sixteenth and seventeenth centuries. At this time Emden was an Imperial Free City and had a large fleet and over three hundred vessels.

It was eclipsed by Bremen and Hamburg, which were better located as ports and were able to nullify the advantages of Emden's staple rights. In 1744 both Emden and Friesland fell to Prussia, and Frederick the Great sought to develop his only port on the North Sea by establishing a free port in 1750 and by encouraging the fishing industry. After a short period of revival during the French revolutionary period, came a deadly blow when in 1806-7 the British took over almost all the ships of Emden, since it was Prussian. Changes were also taking place in the physical characteristics of the Ems channel. A great storm in 1509 caused the Dollart to expand to the west and the Ems to shift its channel. Since 1700 the Dollart diminished in size and the Ems shifted southwards from the town of Emden. Frederick the Great came to the town's aid. In 1768, a short canal from Emden to the Ems was built but this had to be repeatedly extended and deepened. In 1846 it was made into a ship canal four kilometres long, and this has formed the basis of Emden's subsequent development. But Emden was an insignificant port, and even the fact that it was the starting point of the transatlantic cable did not affect the development of the town. In 1850 the total traffic of the port was 28,000 registered tons.

Change did not arrive until the end of the nineteenth century with the construction of the Dortmund-Ems canal. After 1871 there arose the idea of a Mittelland canal to link the Rhine, the Ems, the Weser and the Elbe, and, still further east, the Oder and the Vistula. A first plan was prepared in 1877, by which a canal was to be cut from Ruhrort through Minden to Hanover and Magdeburg. Objections to this plan were raised by the agricultural interests of the trans-Elbian area, who saw the possibility of grain being imported to Germany by the canal. Bremen was also opposed to it, for it wished to have such a canal built not to the Elbe but to the Weser, so as to expand its hinterland. So a new plan was drawn

up in 1882. On reaching the Ems, this river was to be used, and then a canal was to be built across Oldenburg to the Weser at Elsfleth. This would have been named the *Küstenkanal*, and in its latter course it repeated the design of Napoleon I, who envisaged such a canal all the way from the Seine in order to facilitate the movement of foodstuffs during the British Continental blockade of Europe. Such a canal would also have brought benefits to all the German North Sea ports. There was a long controversy with the Junkers of eastern Germany and it was decided to erect the Dortmund-Ems canal. This was undertaken from 1890 to 1899. From the Rhine-Herne canal it was built through Münster to the Ems, then along the right bank of the Ems to Meppen, and thence to the Ems estuary. It had a minimum breadth of twenty-five metres and a depth sufficient for barges of 600 to 700 tons (Fig. 40, p. 259).

This permitted the revival of Emden, for coal, iron ore, and timber, could pass through it to the Ruhr. Harbour constructions with depths of nine to ten metres were built, that were accessible to the largest ships and for the trans-shipment of bulky cargoes. The trade of the port has naturally grown rapidly. In 1903 traffic reached 400,000 tons and in 1913, 750,000 tons. It recuperated rapidly after World War I to over 1 million tons in 1930. In 1932 over 3 million tons of goods were transhipped to and from the canal as against 1.6 in Bremen and 8.3 in Hamburg. The fishing trade is small, however, as compared with the other two ports. Its population reached over 30,000 in the 'thirties (37/31).

In the years before World War I Prussia had intentions of making Emden into a port with overseas connections, for this was the only North Sea port which the State possessed, both Hamburg and Bremen being independent cities. A shipping company was formed and a twenty-year agreement was entered into with the Hamburg Amerika and the Norddeutsche Lloyd whereby Emden was to receive a good share of the liner traffic of Germany.¹ The war came in 1914 and the plans came to nought. The emigration traffic ceased. Cargo traffic by liner vessels is also far more economical if localized in few ports where there are more frequent and regular sailings.

A canal is being built to replace the old and inadequate connections from the Ems to the Weser at Elsfleth. This new canal will connect Papenburg almost directly with the Hunte canal and will be accessible for 1,000-ton barges. The Weser from Minden, where the Mittelland canal joins it, is accessible only for 600-ton barges and even these cannot be fully loaded in periods of low water. In this way, Bremen will be brought much nearer the Ems and the Rhineland. The proposed Hansa

¹ This allowed for a regular weekly service for goods and passengers to New York, that would have allowed for a movement of nearly 1,000 passengers per year, and one cargo vessel a month to each of South America, East Asia and Australia. Provisions were also made to facilitate the establishment of industry in Emden.

canal would accrue still more to the advantage of both Bremen and Hamburg, for it would lead from the Mittelland canal south of Dummer See to the Weser below Bremen, and thence to Hamburg. Bremen would then be nearer the Ruhr than Emden. These developments reduce the hopes of Emden's ever becoming a large sea port to a mere dream. The traffic of Emden is likely to remain in the transshipment of coal to German ports, (although here Emden had to compete between the wars with British coal). It also receives much iron ore for the Ruhr. Any improvements of the Dortmund-Ems canal, on the other hand, would assist the growth of Emden's trade. The improvement of the channel between Herne and Datteln was begun in 1933, but even in the Nazi years the improvement of the whole would have taken many years.

CHAPTER 21

SOUTHWEST GERMANY

GENERAL (Fig. 4, pp. 24-5)

THE GREAT plain through which the Rhine flows from Basel to Bingen is 200 miles long from south to north and has an average width of about twenty-five miles. Both physiographically and hydrographically it is the axis of a single great stretch of country that includes Swabia and Franconia on its eastern side and Alsace and Lorraine on its western side. Framed by the Rhine Massif to the north and the Jura to the south, the Rhine in this section is flanked by the uplands of the Black Forest and the Vosges to the south and the forested plateaus of horizontal Bunter sandstones of the Hardt, Odenwald, and Spessart, to the north. Beyond these two belts of uplands to the east and west there is a succession of similar land forms. These are the forest plateaus of Bunter sandstones; the arable limestone uplands of the Muschelkalk; the plains developed on the Keuper marls; and the wooded uplands with inward facing scarps on the more resistant sandstones (that are particularly well developed on the German side); the lowlands and hills developed on Lias marls and limestones; and then the inward-facing scarps of the plateaus, formed by the gentle outward dip of the Jurassic limestone series. The scarps of the Swabian and Franconian Jura, looking northward and eastward over the lower lands of the Neckar-Main basins, have their counterparts in the Côtes de Moselle that overlook the lowland of the Moselle valley. The Jurassic limestone plateaus in Swabia-Franconia, unlike those of Lorraine, have wide, flat, steep-sided valley floors that cut right across a belt of uplands twenty-five miles wide. These valleys evidently mark the courses of earlier rivers that drained southeastwards to the sea or lake that preceded the Danube. The gradual sinking of the Rhine Rift and the filling in and uplift of the Alpine Foreland changed the base levels of the Rhine and Danube affluents. The rivers flowing to the ancestral Rhine—the Neckar and the Main, and their tributaries—were able to cut back and capture most of the drainage that was directed southwards. Hence the great valley floors of the Swabian Alb, that are now occupied by diminutive streams, like the Altmühl, flowing southwards to join the Danube. Small rivers cut into the edge of the main scarp to the north, but no main river flows parallel to it. On the other hand, in Lorraine there is a single main river, the Moselle, which collects much of the

drainage from the Vosges, and flows at the foot of the limestone scarp northwards to cut into the Rhine Massif and join the Rhine at Koblenz. The short bend in the river at Toul shows that the drainage formerly proceeded westwards, and that the Moselle has been able to cut backward and capture some of it, as is revealed by the "elbow of capture" at Toul. The limestone plateau behind the Côte de Moselle is lower in height and much narrower in width than that of the Swabian-Franconian Jura, and, above all, contains great iron-ore reserves that are absent in the latter. These are some of the differences between the two belts of country that frame what is, in effect, a physiographic unit.

The Upper Rhine Plain has lowland connections with its surroundings. Its northeasterly extension leads to the Wetterau and hence to the West Hesse Corridor. To the south there is a lowland gate, the Burgundian or Belfort Gate, between the Vosges and the Jura, which leads to the historic French province of Burgundy and is commanded by Belfort. The main feature to the east is an open, upland zone, easily transversable by routes, between the Black Forest and the Odenwald. This is the Kraichgau, a most important exit zone from the Rhine Plain, which dwarfs the more restricted routes offered by the gorges of the Main and the Neckar where they cut through the sandstone plateaus of the Odenwald and the Spessart. To the west, there is a corresponding lowland area between the Vosges and the Hardt. This, however, is rather a narrow neck of upland country, commanded by Zabern, which is approached by the lowland embayment from Strasbourg. This, again, is an important routeway (not a zone as is the case of the Kraichgau). Strategically and economically the Zabern Pass has been of first-rate importance in the circulations of eastern France and Strasbourg. There is also a wide lowland zone between the Hunsrück and the Hardt, called the Saar-Nahe hills (*Pfälzer Bergland*), which gives fairly easy access from the northern end of the Rhine Plain to the Saar and thence to Lorraine. Of particular importance here is the narrow trough at the northern foot of the Hardt, which affords an important routeway. This is commanded by Kaiserslautern and Landstuhl. Finally, to the north at Bingen, the Rhine enters its gorge through the high barrier of the Hunsrück and the Taunus. It affords, both by river and by land, one of the great axes of human movements in western Europe. The Upper Rhine Plain is thus a clearly defined country, rimmed by highland on all sides. These highlands are seldom out of sight of the plain, which was and is a great nexus of routeways, with many historic towns. It was the main seat of Germanic civilization in the early Middle Ages.

THE UPPER RHINE PLAIN (Sheet 12, Fig. 89, p. 540)

The Upper Rhine Plain is a rift valley that was formed by down faulting along the summit of a great dome that at the same time was subjected to general uplift. There are two inter-crossing structural trends. A north-south trend is evident in the Black Forest-Vosges and the Hardt-Odenwald areas, while between these a second trend is evident in the structural depression from northeast to southwest, in which lie the Zabern Pass and the Kraichgau. Another depression with the same trend stretches from Saarbrücken to the plain of the lower Main. Folds and fractures with the northeast-southwest trend are insignificant. The major fault lines are in the north-south direction. A series of step faults, sharply defined in the terrain, border the Rhine Rift in the foothill zones. While many of the faults are deeply buried beneath the alluviums laid down by the Rhine, others are partly of post-glacial origin. The main direction of the faults is south-southwest to north-northeast and this accounts for the general trend of the whole plain. But there are also northwest-southeast faults. This intercrossing of fault line gives rise to the jagged edge of the uplands and the varying width of the plain. Further evidences of earth movements are the extinct volcanic cone of the Kaiserstuhl and of the neighbouring hills near Briesach, and the occurrence of thermal waters along the fault lines.

The physiographic elements of the Upper Rhine Plain are:— the foothills of the adjacent uplands (wooded sandstone hills may most appropriately be allied with the uplands, and cultivated undulating land with the Plain); the loess platforms; the diluvial terraces; the alluvial terraces of the rivers. The terrains are shown on Fig. 89, p. 540, Fig. 90, p. 548 and Fig. 68, p. 430.

THE BORDER UPLANDS

The border uplands (*Vorplattenzonen*) include the Rhein-Hesse Plateau and the Sundgau, as areas of deposition in the trough, and the flanking platforms of the main highlands.

The Dinkelberg is a sunken Triassic platform that structurally is akin to the Jura. It drops to the Rhine in a series of faults that are often followed by the streams. The Markgräflerland is also composed of Mesozoic beds that dip westwards from the Bunter sandstone base on the shoulders of the crystalline uplands of the Black Forest. These Mesozoic beds are folded with a southwest to northeast strike and are interrupted by faults on the edge of the Rhine Rift. The surface is an uplifted Pliocene peneplain in which sunshine and soil offer a fertile field for an enterprising peasantry that has converted it to a productive wine- and grain-growing area.

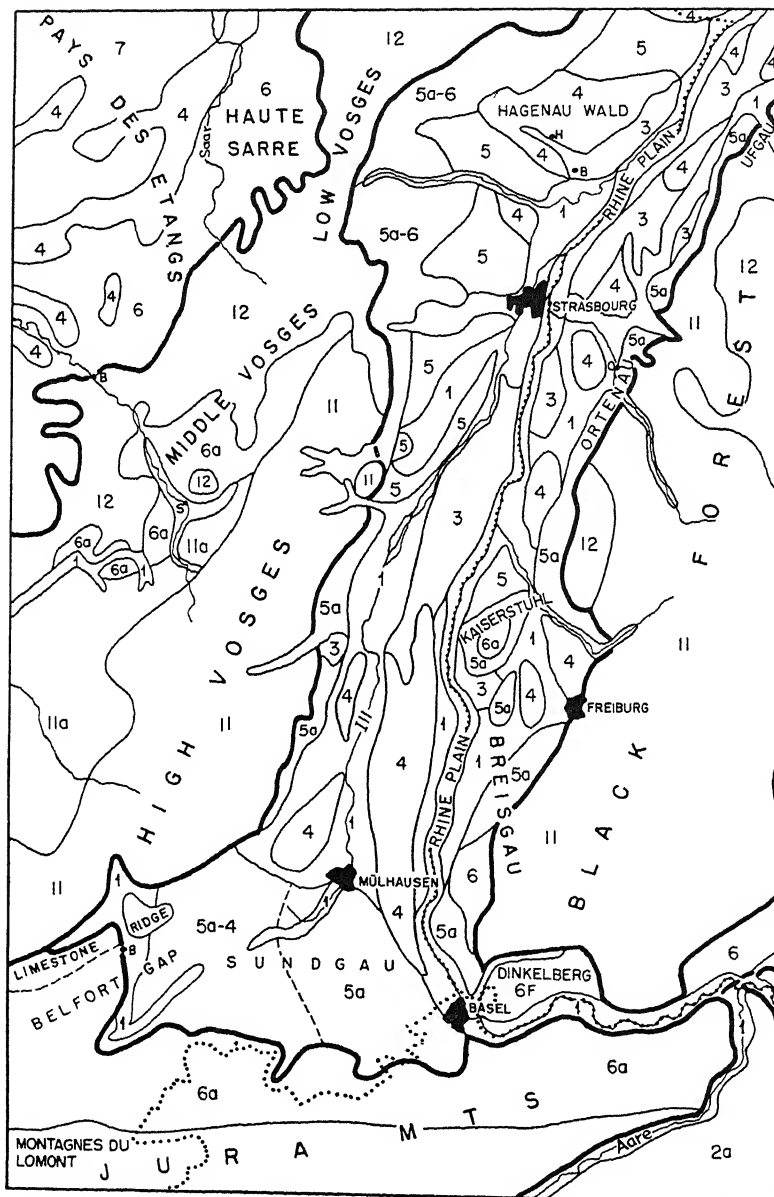


FIG. 89—TERRAINS AND REGIONS: Sheet 12. UPPER RHINELAND (ALSACE-BADEN)

[Continued on next page]

The Sundgau upland closes in the Rhine Plain to the south. It is built of upper Pliocene gravels and forms the watershed of the Rhine and Rhône drainage. The Breisgau foothill zone, four to ten kilometres wide, approaches the Rhine at Istein where the river cuts through an outlying limestone hill outcrop. At Staufen and Freiburg, foothills are absent and the upland abuts abruptly on the plain. Isolated hills, however, rise above the plain, like those near Breisach and the Kaiserstuhl. The latter, volcanic in its western part, with Mesozoic and Tertiary strata in its eastern part, is covered with loess on its lower slopes that give the characteristic terrain of open arable land, with sharply nicked valleys on its dry surface. North to Darmstadt the eastern highland drops abruptly to the plain. On the French side, too, the southern Vosges drop abruptly to the plain, and small towns lie at the exits of the valleys and terraced vineyards clothe the hill slopes. But behind Strasbourg, the foothill zone again attains a width of twenty kilometres in the Zabern *Bruchfeld* which merges eastwards into the loess-covered diluvial plain. North of Strasbourg, the diluvial platform of sands and gravels reaches to the uplands, and these deposits are often covered with loess. Thus, strips of woodland and meadow lie along the flat valley floors, but the

Fig. 89. This sheet covers the southwestern corner of Germany in Baden and Alsace. Four main physiographic units extend from north to south:

- | | |
|--------------------------|-------------------------|
| (i) The Lorraine plateau | (iii) Upper Rhine Plain |
| (ii) The Vosges | (iv) The Black Forest |

The Upper Rhine Plain has a north-south arrangement of its varied physiographic elements: the foothills of the adjacent uplands (5a and 6), the loess-covered terraces (5), low (often wooded) (4), lower terraces (3), and river flood-plain (1).

1. *Alluvial Plains.* Liable to flood.
 - (a) Rhine Plain enclosed by dykes. Marsh (*Ried*), woods (willow alder and poplar).
 - (b) Alluvial Plain flanking the Rhine. Numerous small streams. Mainly heavy clay, with some sand and loam, marsh and woods. Cultivated areas with compact villages.
2. *Undulating Land: Clay or Loam soil.* Mainly cultivated (arable and grass), with woodland. Both compact villages and dispersed farms.
3. *Sand and Gravel: Low Terrace.* Mainly forested. Very little cultivation or settlement.
5. *Undulating Arable Land: Loess-loam soils.* Few streams. Over 70% arable. No hedges or ditches. No woodland. Compact villages. No dispersed farmsteads.
- 5a. *Undulating Arable Land.* As 5, but more undulating or hilly. Vineyards and/or orchards. Compact villages on edge of flanking highlands.
6. *Undulating Land: Loam on Limestone.* Generally open arable. Usually little woodland. (F is forested.)
- 6a. *Undulating or Hilly on Limestone or Marls.* Limestone ridges steep-edged, wooded. Lower land mainly with loam soils. Open cultivated. Compact villages.
7. *Undulating Lowland with Low Hills. Heavy Clays.* Many streams and small lakes. 50% to 70% open arable. Many woods and copses and some hedged pasture.
11. *Rugged Granite Highland.* Over 600 metres. Deep valleys and gorges cut in high plateau. Forested (conifers) with clearings, especially in the valleys.
12. *Dissected Plateaus of Horizontal Sandstones.* Deep valleys, thin sandy soils, all forested, very few cultivated clearings.

intervening loess lands are covered with unhedged fields, vineyards and orchards, while the upland edge is a continuous belt of vineyards where lie the villages and the towns. In the southern Palatinate, the loess zone reaches a width of twenty kilometres, but northwards it narrows as the river plain widens. The old bishops' cities of Worms and Speyer are situated where this raised land impinges on the river.

The Rhine-Hesse upland (*Rhein-Hessische Hügelland*) is undulating in relief, of 230–250 metres altitude, with a loess cover and a black soil that reflect the steppe climate of this dry warm sector. Its geological basis is a floor of horizontal limestones (Miocene) which outcrop on the flanks of its shallow valleys. Beneath these are impermeable marls, which are the cause of many local landslips. At one or two places the limestones impinge on the river and form well-developed high bluffs. It is therefore fertile, and has virtually no woods and meadows. It is also a rich grain land, and vineyards and orchards cover its valley slopes.

THE PLAIN PROPER: TERRAINS (Fig. 116)

The central or inner section of the Upper Rhine Plain is the area that is more closely allied with the river itself, and falls for the most part into the low terrace and the present flood plains. The plains are normally waterlogged meadows, which are described as *Riede*. They form a zone about fifteen kilometres wide from Colmar to Rastatt, below which point it has a fairly steady width of some five to eight kilometres. The scarped edge of the low terrace rises 25 metres above the river level at Basel, four metres at Breisach, then disappears in the centre in between Kaiserstuhl and Strasbourg, where the plain is quite flat, and reappears northwards at heights of eight metres above the river level at Rastatt and ten metres at Mannheim. The low terrace is wide in Alsace above Colmar but relatively narrow on the opposite side in Baden. North of the Kaiserstuhl it disappears altogether beneath recent alluviums, but emerges again to the north as a continuous strip ten kilometres wide between the Rhine and the foothills. It here includes large areas of the gravel fans of the Neckar and Main in which the soils are dry and wooded, in contrast to the waterlogged alluvial plain, in which the rivers reach the Rhine by northerly diversions. West of the Rhine, the terrace rises westwards to the Haardt and is covered with loess. This continuous loess platform is deeply indented and broken partly into sections by the alluvial plains of the tributary valleys.

The river flood plain, sunken a few metres below the lower terrace, is three to four kilometres wide as a rule, seven kilometres in the north and middle, and twelve kilometres near Mannheim and north of Worms at the chief river confluences. Its deposits in the south are gravels, but

below Rastatt they are sands and neither are as productive as the loess soils. In the wide flood plain in the centre there are extensive water-logged meadows. Deposition is normally greatest near the Rhine, while its small tributaries follow devious courses before finally reaching the main river. Their diversion is normally to the north, and this is most marked in the case of the Ill. The Kinzig, Murg and Neckar also have such northerly diversions.

Sand dunes become a marked feature north of Rastatt, as far as Frankfurt, and reach up to twenty-four metres high. These are almost entirely forested with pines and oaks. Karlsruhe was established on the site of a hunting lodge in the midst of such forests. On the east bank of the Rhine varied rocks occasionally reach the surface as low hills. Thus, in the south, sandstones form ridges 200 metres high, and below Hanau basalts form hills 133 metres high. The lower Main and its continuation in the Wetterau are covered with loess, a platform 200 metres high, that carries the old highway to the crossing of the Main at Frankfurt. Beyond the meadows of the Main flood plain there are extensive tracts of forest-covered gravels above which rise low red sandstone ridges. The terrace levels are well marked in this area, the middle terrace covering wide areas at 100 to 120 metres, the low terrace is sunken by about twenty metres along the Main, below which again the river plain is sunken by about eight to ten metres. The middle terrace, being well above the water table, and containing sandy deposits, is dry and forested with pines.

Thus, there is a north-south arrangement of terrains on the plain that is very clear north of the Kaiserstuhl (Fig. 89). On each side of the Rhine, there is a narrow fertile strip of the low terrace at the foot of the hills; then a zone of flat meadow and brushland at the water level and normally liable to flood; then a second raised, and drier, strip of the low terrace; and finally the damp meadows and alder wood on the alluvial floor of the Rhine flood plain itself. Settlements and fields avoid the wet land and are arranged in four parallel strips—on the edges of the uplands and on the two terraces. Where the *Hochgestade* drops sharply to the Rhine flood plain, settlements lie on the higher land, but where the Low Terrace lies at the same level as the Rhine, such protected sites and easier river crossings are absent. Dykes were built to confine the river and have made possible the cultivation of the land on the flats. Without such protection, the town of Mannheim, for instance, could never have been built.

The primitive river bed in its upper course was traversed by a wild, shifting river, changing its course among gravel banks and islands. It has since been confined within dykes, beyond which are ill-drained land, with marsh, ponds and cut-offs. Below the confluence of the Murg and Lauter (about Karlsruhe) the river pursued a single course in great shifting meanders. Here, too, the river has been dyked. The swift current and

shallow depth above Strasbourg still make navigation difficult. In this sector marsh, water and bog make this a deserted zone, separating Alsace from Baden. The Rhine valley between Basel and Breisach is slightly incised in the low terrace (three metres). In this section the river cuts through the limestone hills outliers at Istein so that the river narrows and is obstructed by rapids. Traffic in this section is brought to a standstill in the periods of low water in autumn and winter. A German-Swiss plan aims at making a depth of two metres and a width of eighty metres for 320 days for 1,000-ton barges. The French are building a side canal with eight locks that will serve to generate electricity.

In Alsace south of Strasbourg the loess platform and the foothills are much narrower than to the north. The plains contain large areas of swamp (*Ried*) together with higher strips such as that along the edge of which lie Schlettstadt and Rappoltswiler. The routes avoid the *Ried* by hugging the edge of the Vosges south to Colmar and Mühlhausen. In this foothill zone vineyards are extensive and cultivation intensive around the large compact village for this zone is especially warm and dry, since it lies in the lee of the Vosges and also experiences föhn-like winds in the winter months that blow down the Vosges valleys. There are borings for potash salt at the southern end of the Plain.

THE PLAIN PROPER: SETTLEMENT (Fig. 116)

The Upper Rhine Plain was embraced by the settlement of the Roman era, for the outer defences of the Roman lines ran across the Neckar lands so as to protect the Rhinelands behind them. Here were Roman settlements and many smaller fortresses were erected along the frontier zone. Here, too, were established some of the earliest churches and monasteries of Germany under the Merovingian and Carolingian emperors. But urban growth in the early Middle Ages was tardy and the overwhelming majority of its many small towns did not come into being as towns until the later Middle Ages, and then frequently in association with a castle or as the planned extension of an already existing village settlement. Later growth came in the seventeenth and eighteenth centuries with the establishment of royal residences, notably those of Karlsruhe and Mannheim, Darmstadt and Rastatt, and of fortresses, such as Mannheim and Strasbourg and the small town of Neubrisach. But modern growth has been associated in particular with the development of the Rhine as a great navigable highway, through which medium, as well as through the highway and the railway, the cities serve as regional centres as well as ports. Productive surroundings, the convergence of overland routes, and the proximity of the Rhine, as a valley route and as a river route, have contributed at various stages and in various ways to the growth of

urbanism in this area. The marketing of local farm supplies has been of more vital importance than long-distance trade in the growth and functions of the many small towns. The great highways were important but contributed little to the origin and function of the small towns. It was not until 1230 that the St. Gotthard pass was open to through traffic across the Alps.

The prehistoric settlements lay in the foothills, on the loess platform and on the low terrace. Roman settlements were located on the left bank as easterly outliers of Rome, and their sites commanded the best natural routeways in Alsace and the Palatinate westwards to Gaul. The area was settled by Germanic tribes—Franks in the north, and Alemannic in the south—though place names west of the Rhine bear evidence of preceding Celtic inhabitants (p. 325). The first Germanic settlements bear the place name suffixes of *heim* and *ingen*. The former dominate in the northern Frankish area and in Alsace. Only in Breisgau do *heim* suffixes appear, and they were presumably associated with the first Alemannic settlement. The divide between the Frankish and Alemannic spheres is the extensive zone of *Ried* in the centre of the Plain. In the Middle Ages, forest clearance in the sand areas and on the flood plains accounts for such suffixes as *hagen*, *haim*, *hart*, *au*, *luch* (*loch*), *tung*, *hurst*. The location of the castles in the foothill zone is revealed by the frequency of the suffix *burg*, while more recent settlements (since the Middle Ages) bear proper names, such as Friedrichsfeld. The productivity of the land is reflected in the density of its numerous compact villages. They are spaced at intervals of 3.6 km. along the Hessian Bergstrasse, 2.9 to 2.7 km. on the border of the Rhine-Hessian Upland and on the low terrace; but in the sandy areas they are 6 km. apart. Small-holdings and horticultural methods and vine cultivation are general. The village has a semi-urban character in function and aspect, especially in the foothill zones, where most of the vineyards are concentrated. Large barns are absent, and the multi-storied houses have cellars for wine-making and storage, with outside staircases leading to the living quarters above. Compact villages containing such house types have often over 1,000 inhabitants. There are walled villages and fortified churches, as in Rhein-Hesse, for this region has always been a zone of movement, without any protective barriers, and lacked political unity in the Middle Ages.

The Upper Rhine Plain is both a rich agricultural area and a great industrial area. It has over 4½ million inhabitants, of whom over 40 per cent live in towns. In no other part of Germany is there such a concentration of urban life. Densities of population range widely. In the rich vine-growing areas in the south there are 100 to 200 persons per sq. km. In the foothills, where industries cluster in small towns,

densities reach 400 per sq. km. But higher densities, due to the marked concentration of industry, are found in the northern half of the plain, beyond Rastatt, where the main clusters are around Mannheim and Frankfurt and in the small industrialized towns of the Hessian Ried and the Bergstrasse between them. Here densities reach 300 to 400 per sq. km. These northern areas have increased rapidly, while the southern half has often decreased.

This division between the northern and southern halves of the plain broadly corresponds to the historical political division between the divided land of Alsace and Baden to the south, and the Kur-Pfalz and the Frankfurt-Main areas in the north, and to the more ancient division between the lands of the Alemanni and Franks (Swabia and Franconia). The great wealth of these lands in crops and crafts caused competition between rival territorial lords and, especially after the fall of the Hohenstaufen in the early thirteenth century, the lands became greatly divided and cities became independent. No single power was able to effect control over the whole; it was divided into more or less permanent political entities with a large number of independent towns, especially those of Alsace. At the southern end, the Zähringen dukes and after them the Habsburgs, controlled the lands in Breisgau and the Sundgau. The imperial city of Basel was the natural focus of this land, but it retained its independence until it threw in its lot with the Swiss Confederation. Today, the settlements in the south of Baden are drawn into the economic orbit of Basel. The route from Basel through the Burgundian Gate is commanded by Mülhausen in Alsace, centre of the old province of Sundgau. This town severed its connection with Switzerland in 1798. It developed a textile industry about this time, and organized its spread in the Vosges. It has still further enjoyed contact with the Rhine-Rhône canal, so that its modern development has been intimately associated with France. There is a profusion of small medieval towns in Alsace and Baden, in the foothills and beyond them on the plain. The towns developed in the Middle Ages after 1200 as communities of vine-growers to whom the rights of self-government (*Stadtrecht*) were granted. The Alsace towns became important seats of crafts. A royal residence was established at Hagenau, in the forest north of Strasbourg, and it became a town in 1164. Strasbourg began as a Roman town, and then flourished as a medieval town. Situated on the lower Ill, commanding the routeways west across the loess country to the Zabern pass, it emerged as a great fortress city after the expansion of France to the Rhine in the seventeenth century. Its modern growth is due mainly to the development of navigation on the Rhine, which is navigable by barges of 1,000 tons. Special harbour facilities have been established in most of the towns alongside the river. Strasbourg is the capital of Alsace and the outlet

for Lorraine. Freiburg (108/93) was founded in 1120 by the Zähringen and became the capital of the Breisgau under the Habsburgs.

All the Roman towns and the early bishops' sees on the Rhine Plain lay on the left bank of the river. And this indeed is as true today as in the early Middle Ages, since both Mannheim and Karlsruhe were foundations of the Baroque era. This series includes, from north to south, Mainz, Worms, Speyer, Strasbourg and Basel. There were no towns on the right bank until Karlsruhe and Mannheim were established on *terra nova*. It was on the left bank that firm land reached the river. Here the main roads of Roman Gaul terminated at outposts of the Empire. The chief of the medieval towns on the right bank lay back from the river on the edge of the plain. These were Frankfurt-am-Main, Heidelberg, Freiburg-im-Breisgau and on the west side, Hagenau and Colmar and Mühlhausen. These were the chief of a large number of smaller towns that were strung along the edge of the plain at the foot of the bordering hills. No more towns grew up in the later Middle Ages on the river bank itself. The only good sites with good communications from the river were already occupied.

The foothill towns of the Vosges are repeated north of the Forest of Hagenau in those that lie on the edge of the Pfälzer Wald or Haardt. Among these, the chief towns are Landau and Neustadt, sited at the exits of valleys and surrounded by vineyards and orchards. There are few towns here. The chief are found in the eastern edge of the plain between Karlsruhe and Darmstadt, and particularly numerous are the villages on the Bergstrasse, immediately north of Heidelberg. Karlsruhe, founded in 1715 by the Margrave of Baden, with a radial plan centred on the royal palace on the edge of the forest, has grown in virtue of its Rhine traffic. This amounts to over 2 million tons and is, together with industry, the major occupation of its inhabitants (184/172). Heidelberg lies at the exit of the Neckar Valley from the Odenwald. It lies at the foot of its castle along the narrow strip of flatland surrounded by wooded, red sandstone hills. Its medieval university and the modern growth of industry beyond the valley on the plain account for its 112,000 inhabitants. Mannheim was established in 1720 by the Elector of the Palatinate as a royal residence, with a grid plan and a circular wall, after the original town, founded in the early seventeenth century, had been raised to the ground by the French. It lies on the north bank of the Neckar, just before its confluence with the Rhine. Its modern growth has been especially associated with the Rhine traffic, which, together with that of Ludwigshafen on the opposite bank of the river, amounts to 10 million tons (coal, oil, grain). Mannheim is also an important railway centre and distributes and collects grain throughout the southwest, including Switzerland. This double town has attracted heavy industry, particularly chemicals in

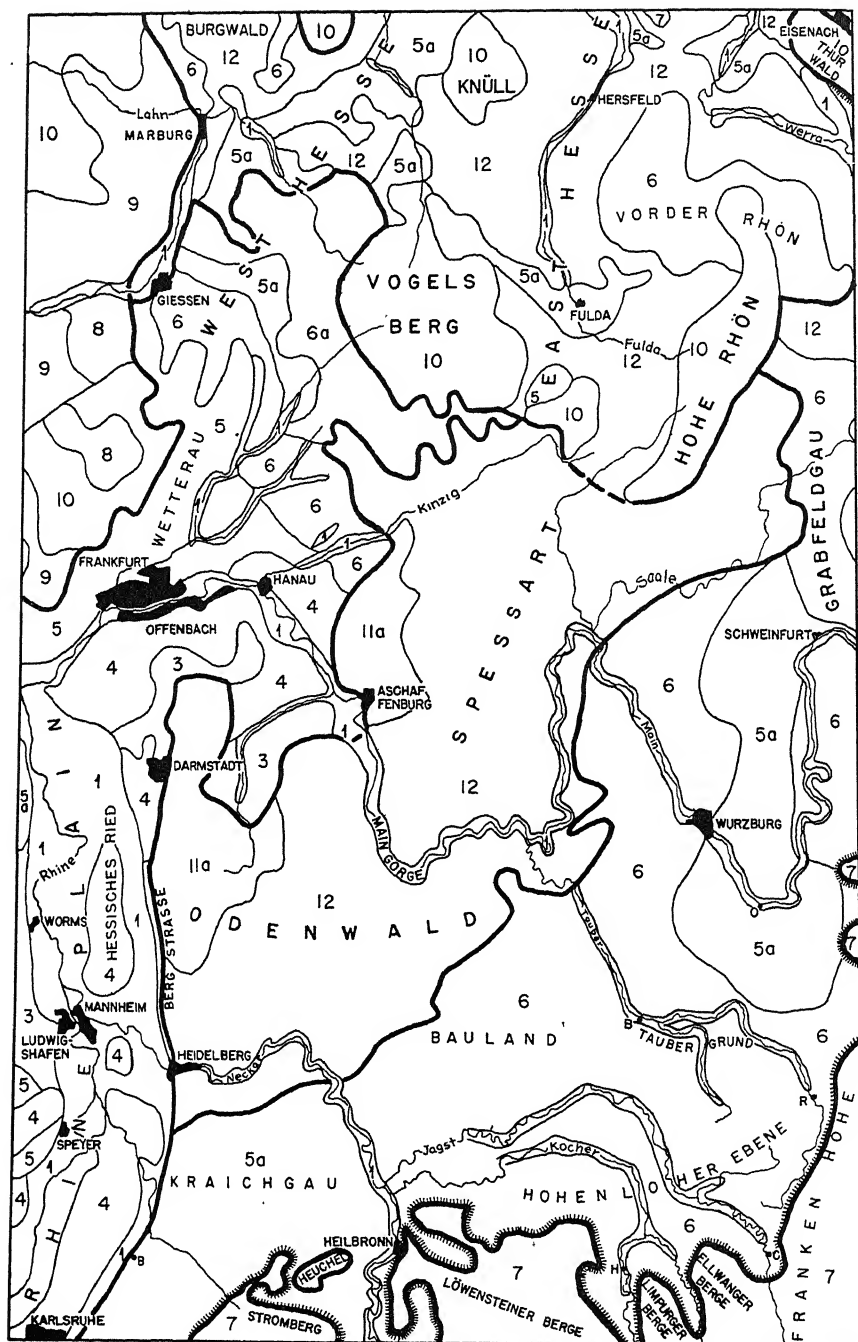


FIG. 90—TERRAINS AND REGIONS: Sheet 10. RHINE-HESSE

[Continued on next page]

Ludwigshafen, which has developed entirely since 1850 as a river port and industrial centre. The two together, with neighbouring satellite residential and industrial towns, had in 1937 425,000 people (1946, 317,000). On

Fig. 90. Sheet 10 covers the Hesse Uplands, Odenwald-Spessart Highlands, the Main and Neckar lands, and a portion of the Upper Rhine Plain between Frankfurt and Karlsruhe.

The main features of the Hesse Uplands are the Vogelsberg and Rhön. North of these the Werra and Fulda drain northwards and the Kinzig southwards. Its complicated relief is oriented from north to south in four physiographic belts that are continued to the area on the next sheet to the north in the Kassel area. These are:

- | | |
|--|--|
| (i) Hesse Depression (Wetterau-
Weser valley) | (iii) The East Hesse Depression
(Fulda-Leine valleys) |
| (ii) Vogelsberg-Knüll-Meissner-
Solling Highlands | (iv) The Spessart-Rhön Highlands |

The whole is built of horizontal limestones and sandstones that are faulted into north-south troughs and raised blocks, and it is dominated by rounded basaltic massifs and a peppering of residual volcanic hills and necks that lie around them. Loess deposits occupy the wide and open lowlands in the two depressions that have long served as the main corridors of movement across central Germany.

1. *Alluvial Plains*. Heavy clays in river valleys liable to flood.

(a) Rhine flood-plain enclosed in dikes, marsh, backwaters, woods (willow alder and poplar.)

(b) Alluvial plains flanking the Rhine. Numerous small streams; marsh and woods. Cultivated open areas with compact villages.

3. *Low Plateau of Sand and Gravel: Low Terraces and Dunes*. Mainly under cultivation with areas of forest and heath. Compact villages. Little woodland.

4. *Low Plateau of Sand and Gravel: Low Terrace*. Mainly forested with open arable clearings and compact villages. Chief areas are on the gravels of the Rhine Plain.

5. *Undulating Arable Land on Loess-Loam soil*. Few streams. Over 70% arable. No hedges or ditches. No woodlands. Compact villages. The Wetterau and its north continuation in the West Hesse Depression; the Fulda Valley and patches in the Rhine Plain.

- 5a. *Undulating Arable Land*.

(i) As 5; loess loam on horizontal limestones, but more undulating or even hilly with marked steep-sided valleys. Vineyards and orchards, e.g. Kraichgau and Würzburg areas. Open zone at foot of Fränkische Alb.

(ii) *Bergstrasse*. Narrow strip of foothills on the edge of the Odenwald and Rhine Plain. Loess-loam soil. Orchards, vineyards, small fields. Compact villages.

6. *Undulating Land* on horizontal limestone strata with thin loam soil, crossed by steep-sided wide valleys up to 100 metres deep. Open unhedged arable land, compact villages, considerable woodland. Valley slopes have orchards and vineyards. Areas of heath and scrub on bare limestones. Includes the Hohenloher Ebene, Halle Ebene, Taubergrund.

- 6a. *Undulating Basalt Upland* in the western slopes of the Vogelsberg.

7. *Undulating Sandstone Upland* with broken scarp racing north and west. Horizontal sandstones and marls, heavy clay soil, numerous small streams. Dominantly forested (coniferous) with clearings and small hamlets. Vineyards and orchards on scarp slopes.

10. *Basalt Highland (Oberwald)* (Sheet 10) *Beech forest, meadowland*. Villages up to 650 metres. Hohe Rhön has beech forest and cattle raising. Land use is $\frac{1}{3}$ forest, $\frac{1}{3}$ grass, $\frac{1}{3}$ arable. Knüll is a wooded sandstone plateau (pine) with basaltic hills (beech).

11. *Rugged Granite Highland*. Over 600 metres. Deep valleys and gorges cut in high plateaus. Beech, fir, spruce forests, with clearings, especially in valleys.

- 11a. *Undulating Granite Highlands*; with mixed cultivation. Small woods and copses. Isolated farmsteads.

12. *Dissected Plateaus of Horizontal Sandstones*. Deep valleys, thin sandy soils, all forested, few cultivated clearings.

Note. C = Crailsheim in southeast corner.

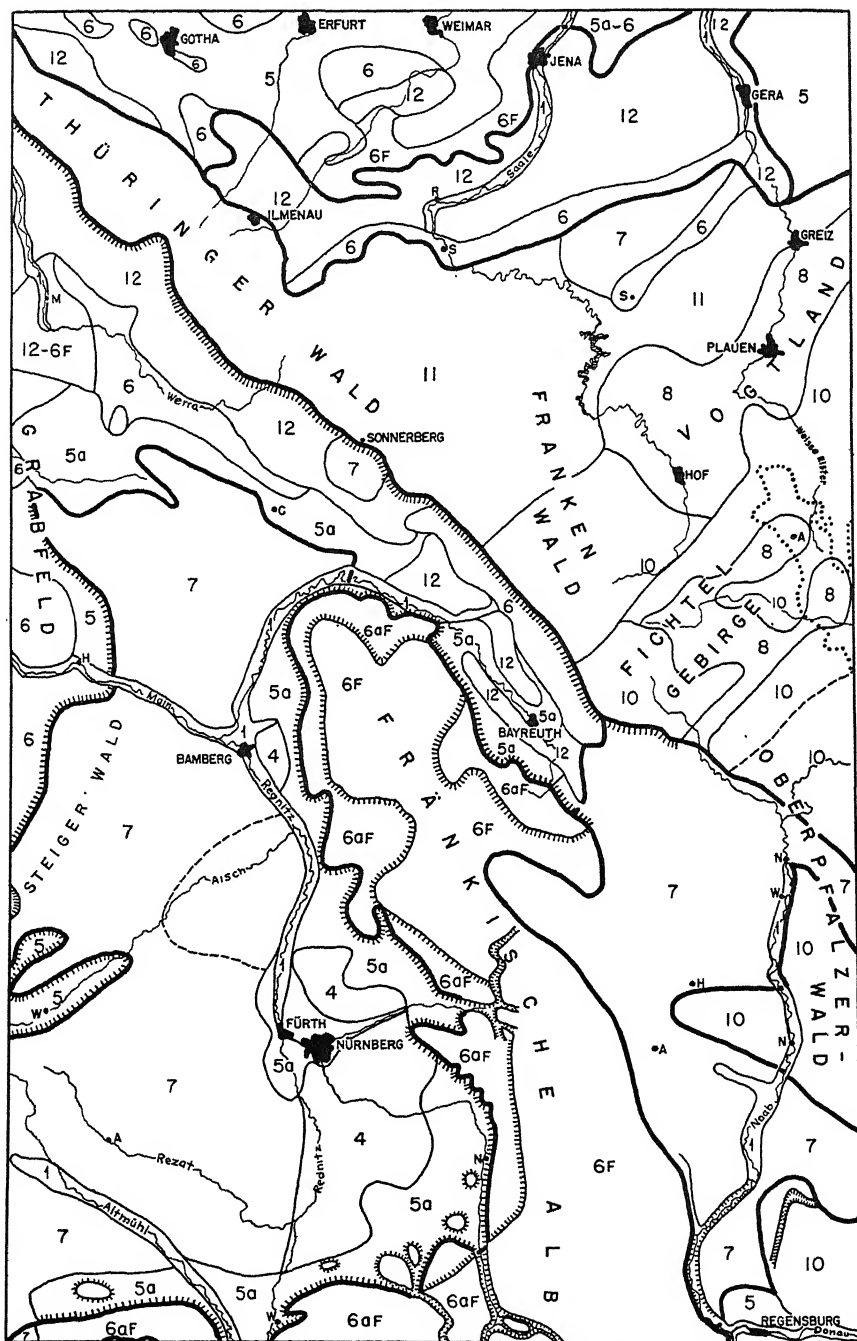


FIG. 91—TERRAINS AND REGIONS: Sheet 11. NORTH BAVARIA

[Continued on next page]

the opposite bank Speyer and Worms are both ancient bishoprics but have not grown much through the growth of industry and so retain much of their historic character.

THE RHINE-MAIN URBAN COMPLEX: FRANKFURT-AM-MAIN

The main concentration of urban population is at the northern end of the plain (Fig. 90). Here, within fifty kilometres from north to south and thirty kilometres from east to west, there are three cities with 100,000 and nine others with over 25,000 inhabitants. Aschaffenburg (43/36) lies at the exit of the Main from the Spessart uplands at the head of navigation of the Main, with a river goods traffic of 1 million tons and important timber and woodworking industries. Darmstadt (111/76) was formerly the royal residence of Hesse but has grown more recently as a seat of industry. These are both outlying centres. The others are more closely spaced on the Mainz-Frankfurt axis, at the confluence of the Mainz and the Rhine. The location and size of these towns is due above all to their situation at a great crossways of natural routes. Mainz (120/75), situated on raised land on the west bank of the Rhine, was a Roman centre and the seat of an early archbishopric that was famous throughout the Middle

Fig. 91. This sheet covers the highlands of the Thüringer Wald, Frankenwald, Vogtland, and Fichtelgebirge; the southern part of the Thuringian basin; and the eastern section of the Southern Scarplands. Note the north-south arrangement in the latter of dissected scarp zone in the west, Keuper marls upland, Rednitz lowland (Bamberg-Nuremberg); dissected scarp zone and highland of the Franconian Alb.; and the Werra-Naab lowland between the Alb and the Massif from Meiningen on the upper Werra to Regensburg on the Danube.

Key as for Sheet 10 (Fig. 90) with the addition of the following:

6F. *Undulating or Hilly Limestone Uplands, Forested.* Few surface streams, dry valleys. Cultivated clearings and compact villages. This is the Franconian Alb. Karst.

6aF. *Deeply Dissected Scarp Zone*, the west edge of the Franconian Alb. Steep slopes, 100-200 metres, deep valley re-entrants and hill outliers. Compact villages. Orchards, hops. Limestone crags and woods on upper slopes.

8. *Vogtland.* A continuation of the Frankenwald. Undulating uplands, 450-550 metres altitude, rolling relief with shallow valleys. Valleys become deeply cut on the north and south borders of the belt. Thin loam soil. Large proportion of arable land (50% and over). Closely settled with close road net.

10. *Frankenwald* (Sheet 11). *Undulating Plateau on Granite and Gneiss Rocks.* Rolling hills and shallow valleys. Thin clay soils, much bog, forest and heath, but arable land often covers about half of the total area.

10-8. *Fichtelgebirge* and 10, *Granite Highland* with rolling relief. Coniferous forest, bogs, lakes and bare granite rocks. 8. *Meadow and Arable on Undulating Land* cover 30-50% of the total area, and close net of settlement and roads on the frontier zone.

11. *Dissected Highland (over 500-600 metres altitude).* High scarp to the southwest and drainage to the northeast. Deeply dissected forested highland in the Thüringer Wald with close net of roads and settlement in valleys aligned southwest to northeast.

12. *Dissected Plateau of Horizontal (Bunter) Sandstones.* Deep, steep-sided winding valleys. Thin sandy soil, mainly forested with some scattered clearings.

Note. M = Meiningen at northwest corner.

Ages. It was strongly fortified with bastions and walls (begun by the Swedes) about 1650 until these were demolished in 1850. On the flat alluvial lands on the east bank is the bridgehead of Kastel (strongly fortified by Napoleon). Further north lies Wiesbaden (187/188), the resort town that grew to greatness in the seventeenth century as the resort of the wealthy. Situated on raised land its hot salt springs attracted Roman settlement. It became a medieval castle town of the counts of Nassau after 1200, and from 1744 to 1866 it was the capital city of Nassau when it acquired its modern fame as a health resort. Biebrich nearby has a big chemical plant between Mainz and Wiesbaden. The whole, Mainz, Biebrich and Wiesbaden, in effect, thus forms one great urban agglomeration with a population of over 300,000.

Frankfurt-on-Main (548/424) began as a Carolingian *königshof* on the north bank of the lower Main. It soon became an important focus of routes in the Rhinelands and was early selected as the seat of the courts of the Carolingian Emperors. It became one of the greatest seats of industry and commerce and an independent *Reichstadt* in the Middle Ages. In the nineteenth century it was able to profit from the Rhine traffic, which reaches up the Main to the extensive harbour area above the city on the north bank of the river. It is also, like Mainz, a bridge town and, in consequence, an important focus of old and modern highways and railways. Its fairs were world renowned in the Middle Ages and after, and still retain their high repute. Just as Basel at the southern end of the Rhine Rift joined its fate with Switzerland by free choice, so Frankfurt was absorbed by Prussia, so that although a potential metropolitan focus, it has never been a political capital. It is probably more suited on geographic and historic grounds to fulfill this role than any other city in the German lands. Adjacent to it are a number of smaller satellite towns. These include Höchst and Griesheim, the seats of chemical industries on the north bank of the Main below Frankfurt; Offenbach and Sachsenhausen are both directly opposite Frankfurt on the south bank of the river and form a part of the same conurbation, that numbers about 600,000. Hanau, the jewellery town, lies further afield.

The original nucleus of settlement at Frankfurt became an imperial residence in the Carolingian era (Fig. 92). First mentioned about A.D. 800, and recorded as a *castellum* in A.D. 994, this site was later chosen for that of the cathedral. The site of this initial settlement forms an oval nucleus and was the beginning of the *Altstadt* and had its centre on the east-west street market called the *Alter Markt*. It is usually supposed that the first wall ran alongside this nucleus parallel to the river front. There is, however, no evidence of a wall west of the Römerberg. Thus, the Altstadt proper grew westwards from the royal stronghold nucleus, and on the western border of the latter was placed

the open space of the Römerberg. This extended settlement had an area of 100 acres as compared with twelve acres for the royal burg. It consists of two streets parallel to the river front. The next extension to the Altstadt proper to the north took place in the latter half of the twelfth century and was built up during the thirteenth century, including several monasteries in the more open land near the walls. The chief streets were the Fahrgasse and Schnurgasse. In the middle of the fifteenth century two-thirds of the population of the town (total 8,000) lived in the Altstadt. The bastioned wall system was built in the middle of the

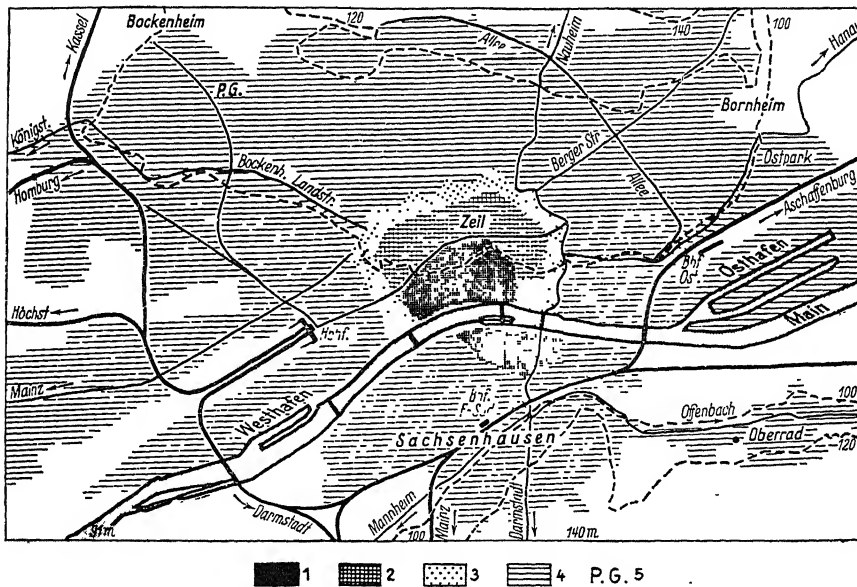


FIG. 92—FRANKFURT-ON-MAIN (from Braun) (scale, 1 : 75,000)

1. Town nucleus (Altstadt) in 12th century (close-hatched area)
2. Extension in 14th century
3. Wall in 17th century, enclosing Neustadt
4. Modern growth
5. Palmengarten (Palm Gardens)

Dashed lines are contours. See the section and map in *The West European City*, 1951.

seventeenth century just beyond the wall. In the first decade of the nineteenth century the fortifications were demolished (unlike Strasbourg, for example, where the walls remained until the 'seventies), so that the urban area could freely expand. Gardens and public buildings were laid out on the site of the fortified belt. At this time only a little over 2 per cent of the population lived outside the walls. In 1869 a map shows that there was a sprinkling of houses with gardens right around the outskirts

of the town with the principal station, railway tracks and yards in the west and one to the east of the town. One railway ran along the river front and a second crossed the river from the western station so as to encircle the south side of Sachsenhausen.

The beginnings of *Citybildung* are to be found in the Altstadt in the 'seventies, but the steady decrease of population did not begin till after 1890. The population of the outer districts has increased rapidly, for in 1871 they included 27.7 per cent of the total, in 1885 46.8 per cent, and in 1925 they had five times as many people as the inner town.

The more recent expansion of Frankfurt may be traced from its population trends. It early developed dormitory towns or *Trabantenstädte*. Described as such in 1866 are Bornheim, Oberrad and Niederrad, since, entirely rural in 1823 they were at this time already urbanized. This is also true for Bockenheim. These may now be described as *Vorstädte*, so closely are they allied with Frankfurt. The fourteen *Vororte* were annexed to Frankfurt in 1914. Since 1910 they have grown faster than the city itself (1910-25 by 26 per cent as against 10.5 per cent, 1925-33 29.5 per cent as against 0.3 per cent). In 1928 nine more *Vororte* were added to the city with an area of 15,000 acres and a population of 80,000. The biggest of these is Höchst. Today nearly a third of this enormous city area lies in these annexed outer districts. The close ties of these with the city are clearly shown by the fact that sixteen railways and two electric lines radiate in all directions by which workers come daily into the city. In 1900 out of 15,500 gainfully employed workers in Frankfurt who were drawn from outside the city, 6,500 were drawn from a seven-kilometre radius and 12,300 from a fifteen-kilometre radius. In 1927 there were 19,000 workers coming from the fifteen-kilometre radius and 13,700 from beyond. Thus, in 1900, the fifteen-kilometre radius sent 78 per cent and in 1927 58 per cent of the outside workers. In 1927 these outside workers represented $17\frac{1}{2}$ per cent of all workers in Frankfurt. These figures show the process of decentralization in action, and since 1925 it has been planned. At tremendous costs the Frankfurt authorities have established dormitory towns especially in the six-kilometre ring beyond the Nidda river.

The Mainz-Wiesbaden and Frankfurt areas are about seventeen kilometres apart. Between them are small specialized urban settlements, residential centres like Homberg and Neu-Isenburg, and industrial centres like Rüsselsheim, the seat of the Open automobile plant. This whole cluster has not far short of one million inhabitants. Moreover, a large area around this nucleus of this Rhine-Main area is drawn into its web of functional relationships, as is revealed by careful studies of the service areas and areas of food supplies of the cities and of the daily movement of workers who live out in the country or in surrounding urban

centres. The river-borne traffic of the complex amounts to 5 million tons, of which 3 million tons is handled in the port of Frankfurt.

The growth of population in the Rhine-Main region has been marked by the spread of settlement from the towns and a large daily movement of workers to and from the factories and offices. There is also a large normal movement of daily food requirements to the cities. Indeed, this is an excellent example of the close integration of circulations around one great urban complex. These varied aspects have been the subject of careful investigations. An investigation of the daily journey to work in this area, published in 1938,¹ revealed total numbers of "commuters," described as people working in the centre but living outside it, as follows: 28,000 Frankfurt, 6,200 Mainz, 15,000 Rüsselsheim, 4,000 Darmstadt, 6,000 Hanau and 6,500 Offenbach. This study reveals the overlap of the commuting areas of various towns, because of their proximity to each other, the limitation of the journey distance to about one hour in either direction, and the considerable importance of the bus and cycle in the daily movement. There was also a remarkably large movement of workers to the great Opel automobile works at Rüsselsheim between Mainz and Frankfurt. Most of the 15,000 workers working here came from scattered districts to the south of the Main by bus and cycle.² Frankfurt has two main areas of food supply. An inner area around the city produces fruit, vegetable and milk supplies. An outer area, with varied physical features and agricultural conditions in its different sectors and mainly consisting of wooded uplands, sends varied supplies of foodstuffs from scattered areas to the Rhine-Main centres.

We can thus recognize three roughly concentric zones of urban associations. A triangular nuclear area, defined by Mainz-Wiesbaden, Frankfurt and Darmstadt, is closely tied up through the daily movement of workers to and from its centres. All of this area is accessible to Mainz or Frankfurt within one hour and a large part of it within half an hour. It is bounded by the hills to the north, east and west, and by the rival sphere of Mannheim-Ludwigshafen to the south. It has a radius of roughly fifty kilometres from Frankfurt, and its axis is the urban chain we have already noticed. Beyond it is a second zone, which is the main zone of food supplies for the cities and contains satellite towns. A third zone, much more vaguely defined, is thinly peopled, and covers large wooded upland districts, beyond which are rival centres of population and rival cities—the region of Saar-Palatinate to the south, with Saarbrücken and Mannheim as centres; Hesse to the north, centred in Kassel; Siegerland to the north, which is more closely allied economically

¹ See W. Hartke, "Das Arbeits-und Wohnortsgebiet in Rhein-Mainischen Lebensraum," *Rhein-Mainische Forschungen*, Heft 18, 1938.

² See maps in our *City, Region and Regionalism*, pp. 188-190.

with the Ruhr, though the Lahn and Dill valleys fall definitely into the Rhine-Main sphere. The Koblenz region is allied with both Cologne and Frankfurt.

In spite of the unity of this region, in the past as well as in the present, it has always been politically divided. With the political disintegration of the thirteenth century it fell into several parts—the bishoprics of Mainz, Worms and Speyer and the Landgrave of Hesse in the heart of the region; and Nassau in the southeastern sector of the Rhine Plateau. From these there gradually crystallized Hesse in the northeast, Würzburg to the east, Kurpfalz in the south (absorbing the bishoprics of Worms and Speyer); the bishopric of Trier in the Moselle valley; and Nassau in the north (though this again split into several independent territories with the break-up of the dynasty). The territory of the nuclear area belonged mainly to the archbishops of Mainz. After 1866 there were three Prussian provinces—the State of Hesse, the isolated Birkenfeld district of the *Land* of Oldenburg, and parts of Bavaria and Baden on the margins. Frankfurt itself lay in a small corridor of Prussian territory. Today, the area within fifty kilometres of Frankfurt is divided between three States, Bavaria, Hesse and Prussia. The last includes the two government districts (*Regierungsbezirke*) of Wiesbaden and Kassel, so that the urban axis itself is seriously divided politically (Figs. 55 and 56).

All kinds of economic, trade, professional and administrative organizations necessarily cut across these divisions and choose their centres in Frankfurt. There is obviously urgent need for a new arrangement of areas and new powers for purposes of inter-town planning. An unofficial regional planning body was established in the 'twenties and various scientific bodies were concerned between the wars with the investigation of the problems of the region.¹ In the organization of the National Socialist State, the region was recognized as a unit, with the name of Rhine-Main, both for purposes of regional planning and for the organization of the Party, and both of these closely correspond with the area defined above. Under the American occupation, this area has been organized into a new political unit, the State of *Gross Hesse* with Frankfurt as its capital.

THE BLACK FOREST (Figs. 89, 96)

This name is given to the highlands that border the eastern side of the Rhine Rift valley and extend from the Rhine above Basel in the south to the neighbourhood of Pforzheim in the north. Its valleys face partly to the Rhine Plain, partly to the Neckar basin, but several smaller rivers drain south to the Swiss Rhine. A main river, the Murg, drains to the

¹ Such as the *Rhein-Mainischen Forschungen des Geographischen Instituts der Universität Frankfurt-am-Main*. Also the *Rhein-Mainscher Atlas*, edited by Behrmann and Maull.

north, though it flows on the eastern margin of the highland, while the valleys of the Kinzig and the Dreisam penetrate deeply into the highland from the Rhine Rift and afford the chief routeways, the first by rail, the latter by road, across the highland. The name, Schwarzwald, is derived from the sombre tone of the spruce forests that cover most of the highland. Physiographically, the term may be given to the areas of rugged granite highland, whose peneplained surfaces reach the highest altitudes to the south in the rounded summits of the Feldberg (1,493 metres). North of the latter, the highest summit levels have a remarkably consistent height of 900 to 1,000 metres. To the north, however, the name Black Forest, as applied historically to a particular country, extends beyond this highland to the forested plateau which is developed on the horizontal Bunter sandstones. These strata cover the pre-Hercynian base (the crystalline *Grundgebirge*) west of the Murg valley, and dip gradually eastwards where they are covered in turn by the Muschelkalk limestone. The edge of the forested sandstone country is, in effect, the edge of what is traditionally called the Black Forest, and, in the north-west, beyond the Murg valley, is marked by the north-south Nagold valley, in which Pforzheim is situated, where the river emerges on to the open undulating country of the Kraichgau. The Black Forest drops abruptly to the Rhine Plain, but it is bordered, particularly to the south, by a lower and more fertile upland zone, that is developed on a limestone (Muschelkalk) platform.

The Freiburg depression also penetrates deeply into the Rhine front and entrance to it is commanded by the conical volcanic upland of the Kaiserstuhl. Thus, the rounded outlines of the pre-Trias peneplain characterize the south, while in the north stretch the wooded sandstone plateaus, and between these two in the centre is the deeply dissected granitic highland with deep valleys and intervening ridges. On the western border there are several small Permian marl lowlands with patches of porphyry outcrops that stand out as residual hills and afforded excellent sites for medieval castles (Pl. 27).

The Black Forest, however, is less favourably disposed for settlement than its counterpart, the Vosges, for it has fewer deep valleys penetrating to its heart from the Rhine Plain, and it was much more difficult to penetrate by rail. The highest points harboured small glaciers during the Ice Age. From the chief of these on the Feldberg ice reached east to the Titisee and the Schluchsee, and both lakes are due to morainic dams. The upper limit of the tree-line at 1,000 to 1,300 metres is the result of the use of the high summits for pasture, so that the forested area has been gradually destroyed just as in the case of the *Hautes Chaumes* in the Vosges. But the country is still largely forested, especially on the infertile sandstones, that do not reward the labour of forest clearing. Up

to 900 metres the beech and silver-fir are dominant, and then above, especially on the eastern slopes, the spruce. The primitive method of forest-burning for temporary cultivation, to which is due much of the extensive broom and gorse heaths, has now almost disappeared. Meadow, on the other hand, has spread at the expense of arable cultivation and the south in particular practises a pastoral economy very like that of Switzerland.

In the Black Forest, the isolated farmstead and the hamlet are dominant, whereas in the Vosges, in a very similar physical environment, the compact village is the rule. Settlement reaches up to 1,200 metres. Both the Black Forest and the Vosges were settled in the Middle Ages by forest clearance, initiated largely by monasteries. Mining of metals was also an early attraction, but has long ceased to be of importance as an occupation. Running water has been used since the end of the eighteenth century in workshop and factory. The domestic manufacture of clocks, formerly a domestic craft, has become a flourishing factory industry. The forests in the north provide timber for woodworking and paper-making in factories that use electric power derived from dammed lakes. The towns in which these activities are centred lie on the borders of the highland. The chief are Pforzheim, Calw, Nagold and Freudenstadt. Clock-making is centred in Schramberg, St. Georgen and Triberg. Baden-Baden has thermal springs that have made it one of the greatest inland resorts in Europe. The tourist industry in both winter and summer has added to the activities of the heart of the Forest and account for small settlements and many scattered country residences.

The Black Forest was a barrier between the Rhine Plain and the Neckar lands of Württemberg. The Kniebispässe (960 metres) controlled the ways from Strasbourg to Ulm, and the passes east of Freiburg gave access to the upper Danube and thence to Constanze, and the valley of the Rhine was commanded by the Habsburg towns of Waldshut and Säckingen. The Habsburgs, with their seat in Breisgau and their capital in Freiburg, used the Rhine as a frontier for their territories, that spread over the southern Rhineland. Further to the north, the thinly peopled uplands separated Franks, Swabians and Alemanni. Here, to this day, the Baden-Württemberg frontier lies along the deep gorge of the Murg. The southern Black Forest could be more easily penetrated from all sides, and in spite of its greater altitudes, it was unified by the Habsburgs with their chief footings on the western and southern slopes. The open limestone lowland to the east, the Baar country, long remained independent under the rule of the Fürstenberger and the old abbey of St. Blasien. Only in the nineteenth century did the whole of the south fall to Baden. Thereby arose the need for a through route that is now followed by the Schwarzwaldbahn from Offenburg to Donaueschingen. The

Höllentalbahn (Freiburg-Donaueschingen) is less important and the east-west Rhine valley is of little use as a routeway.

THE KRAICHGAU (Fig. 90)

This distinctive name applies to the country between the northern end of the Black Forest and the Odenwald, and is bounded to the west by the Rhine Plain and to the east by the course of the Neckar and its tributary the Enz. Heilbronn and Pforzheim broadly mark its eastern limits. It is a plateau of horizontal Muschelkalk limestone, covered almost everywhere with loess. It drops steeply by a hundred metres to the Rhine Plain and merges eastwards into the Franconian Muschelkalk platform. The Neckar-Enz valley, sunken by some 150 metres, is the clearest limit of the Bauland and the Hohenlohe Ebene. Here an open lowland, twenty-five kilometres wide, lies between the Odenwald and the Keuper sandstone scarp of the Heuchelberg; while to the south a zone ten kilometres wide lies south of the Heuchelberg and Stromberg and leads south to the Württemberg Strohgäu.

The low platform of the Kraichgau is a structural continuation of the Zabern-Pfalzburg trough, both of which are of the greatest importance for routeways that converge on the centre of the Rhine Plain. A wooded sandstone plateau, however, bars the way westwards from Strasbourg, except through the Zabern pass, but in the Kraichgau the open limestone country reaches west from the Neckar-Main basin to make direct contact with the plain. The country of the Kraichgau is undulating, so that the range of vision is very limited, and the average altitude is about 250 metres. It is covered with very fertile loess-loam soils. Three-quarters of the area is under grain and the area has very little woodland. The loam is washed down the gentle slopes after rains and lies thick in the shallow valleys. Only where the limestone rises naked above this cover are the valleys narrower and steeper-sided. The country had originally some open woodland, but the frequency of the steppe-heath flora and of scrub on the sunny southern slopes, now partly devoted to vines and orchards, bear evidence of the open character of its natural landscape. The economy turns on grain, with vines, orchards, hops and tobacco as additional crops in the peasant economy. Prehistoric and Roman settlement was attracted to it, and it was settled by the Germanic Alemanni. The villages are very closely spaced, more so than in the Rhine Plain, and have an average of 500 to 600 inhabitants, and, though small, they are larger than those of the adjacent uplands. The density of population reaches 130 persons per square kilometre and this, together with the law of divided inheritance, has encouraged the pursuit of local crafts and

emigration to the adjacent plain and to the town of Pforzheim, the jewellery centre.

The basalt hill of Steinberg and the outlying Keuper sandstone hills of Strom- and Heuchelberg rise above the platform and the main routes avoid these to the north and south. Three Roman roads crossed the area, two on its northern and southern edges. These courses are roughly followed by the routes of the present railways east from Heidelberg, Bruchsal and Durlach. The northern route has lost some of its importance to the Neckar valley. Of greatest importance today is the southerly route, that formerly crossed the Neckar at Heilbronn, but is now diverted to Stuttgart.

Into this "passage land" penetrated medieval territorial lords. The dukes of Württemberg penetrated from the east, and their territory reached almost as far as Bruchsal and Durlach on the edge of the Rhine Plain. The bishops of Speyer spread along the northern route and Baden-Durlach along the southern route. The northeast sector was much divided between the Palatinate and small lords and imperial cities. Today, there remain many small towns, as a result of the political division of the land, and several Hessian "enclaves" remain on the Baden-Württemberg frontier, one of which is Wimpfen, an old, but small town that began as a Carolingian capital. Otherwise, the whole area belongs to Baden together with the Bauland beyond the Neckar.

SPESSART AND ODENWALD (Fig. 90)

These two plateaus correspond in location and character with the Haardt on the western side of the Rhine, and stretch north from the Kraichgau. They are cut by the gorges of the Main and the Neckar and merge northwards beyond the Kinzig valley into the wooded volcanic uplands of the Vogelsberg and the Rhön. The settlements of the Kinzig valley are allied to those of Hesse, so that the northern end of the Spessart is the boundary between Hesse and Franconia.

This block is a wooded plateau of horizontal sandstones like the Haardt, although in one area, between Gelnhausen and Aschaffenburg in the western Odenwald, crystalline rocks form the surface, outcropping from beneath the sandstone, and giving rise to a more closely dissected undulating country which is more closely settled than the sandstone plateau (Terrain 11a). A similar contrast appears in the Spessart, where a sandstone scarp overlooks the lower crystalline plateau to the west. The contrast between these two landscapes, in terrain, economy, and settlement, is very marked. In the Odenwald the uplands of crystalline rocks cover a third of the area, and the faulting of the Rhine Plain has more marked effects on the relief than on the Spessart, for several of the main

valleys follow fault lines. Thus the steep drop to the Rhine Plain is a fault-scarp whose extreme youth is revealed by the undissected faults between the short overhanging valleys. An east-west profile would reveal that the upland rises from the west by fault-scarps and then slopes gently to the east, rises steeply again, then sinks eastwards to merge into the Muschelkalk platform at a height of 450 metres on the Bauland. Along the most easterly north-south fault lies the basalt hill of the Katzenbuckel (626 metres), the remnant of an intrusive volcanic cone. The long gentle slopes to the east and north to the Main thus stand in marked contrast to the high rugged slopes nearer the Rhine Rift on the western side, where the degree of relief reaches 400 to 500 metres. In the Bunter sandstone in every 1,000 sq. km. there are only 68 km. of valley as compared with 150 km. in the crystalline areas. In the crystalline rocks the valleys are wide and gently sloping, in the sandstone they are narrow and steep. On the sandstones the surface is a dry and springs lie well down the valley sides. The crystalline upland is thus more favourable to settlement, whereas settlement on the dry sandstone plateau is confined to the valleys, either as round forest clearings or as long *Waldhufendörfer* that often occur also on the plateau surface. Settlement in the crystalline upland was associated with the use of the forest, cultivation and meadow land, although crafts such as stone polishing was an added occupation. Much of the land in the sandstone plateaus of both the Spessart and Odenwald remained in the hands of territorial lords and to this day this country is outside the pale of peasant agriculture. Extensive forests are preserved, except for the southern Odenwald, which has been affected by the practice of *Reutberge* and the stripping of the oak barks for the preparation of tannin. In the eighteenth century, glass-blowing and iron-working at small forges caused a phase of immigration into the Spessart. Nevertheless, forest still covers a third of the granite areas and nearly two-thirds of the sandstone area and the density of population is twice as high in the former as in the latter. Wood and meadow cannot support all the population and local crafts are inadequate, so that labourers find casual temporary work in the surrounding industrial area. The tourist industry has merely reached the margins of these isolated uplands, for they lack through cross-country routes.

The Main and the Neckar afford the two chief through routes. Red rocks break through the forests on their steep sides, and above the vineyard-covered slopes lie the ruins of medieval castles that commanded the routeways. Many small towns lay along these valleys, and they retain undisturbed their historic aspect. The Neckar is being improved for navigation with eighteen dams and it is also followed by a railway that forks at the head of the gorge at Neckarelz, one branch continuing to Heilbronn, the other crossing the Bauland and Franconia.

These two main valleys, sunken to depths of 500 metres, are older than the uplands. They superimposed their courses as these uplands were uplifted, and abandoned meanders, high above their present level, are evidence of both uplift and lateral erosion. These features are very similar to those of the Wye valley in Monmouthshire. The uplift is very recent for even in the glacial period the Odenwald was 150 metres below its present level.

PFÄLZER WALD (HAARDT) (Sheet 9, Fig. 68, p. 430)

Beyond the Zabern fault trough (*Bruchfeld*) the belt of Bunter sandstone that links the Vosges and the Haardt is only twenty kilometres wide, and the railways from Hagenau and Strasbourg through the Zabern pass to the Saar are the successors of ways that have been used since Neolithic times. The wooded sandstone hills around the Zabern pass extend from the Vosges, northwards to beyond the Palatinate frontier and thence north to Kaiserslauten. It is called locally the Hart or Haardt, but is also often referred to as the Pfälzer Wald. Its highest points, between 600 and 700 metres, are on its eastern edge, although the streams, cutting down to the base level of the Rhine, cut back to a watershed on its western side. An anticline crosses the southern section from southwest to northeast and this is accompanied by a parallel syncline in the north, so that in the south the valleys cut down to the red sandstones (*Rotliegendes*) and even to the schists, granites and gneisses of the fundament (*Grundgebirge*), so that the valleys are here wider than in the north, where they are deeply cut in the sandstone. Lowlands of erosion, cleared of forest for cultivation, occur in the highlands between Dahn and Albersweiler, and the tabular sandstone is dissected into residual hills with curious weathered forms, of needles and towers, often crowned by castle ruins; this resembles the Saxon Switzerland. Elsewhere the tabular sandstones have wooded undulating plateau surfaces, with deep narrow valleys. The differential erosion of harder and softer strata gives rise to local scarps. Forest covers a full quarter of the whole of the Bavarian Palatinate. Settlement avoids the thin infertile sandy soils of the dry, forested uplands, and wood-cutting over large areas is the only occupation of scattered settlements. In the few valleys, settlements use the running water, and the sandstone is quarried on the margins of the plateau. Thus, the density of population is under 50 per sq. km. Pirmasens (43,000) situated at a height of 400 metres, is a founded town, situated off the main routes. Railways from Landau and Neustadt use the valleys to Zweibrücken and Kaiserslautern, reaching at the latter a depression of forty kilometres long, that affords an easy route to Saarbrücken. This latter is the *Pfälzische Moorniederung* or *Pfälzer Gebruch* and is an eroded

zone between the sandstone plateau and the *Pfälzer Bergland* to the north. It is overlooked on the south by the Sickinger Höhe, a Bunter sandstone scarp, capped by Muschelkalk in the west. In the east it merges into the Rhine-Hesse hill country and to the west leads to St. Ingbert and then beyond to Saarbrücken. In the Middle Ages bog lay between Kaiserslautern and Homburg, but now it is drained and pine plantations alternate with meadow and heath.

SAAR-NAHE UPLANDS (THE PFÄLZER BERGLAND) (Fig. 68)

This is a zone of relatively open, undulating country, some 40 kilometres wide, that lies between the northern edge of the Haardt and the southern edge of the Hunsrück. It merges eastwards into the Rhine-Hesse hill country and westwards into the Saar Lowland. It is drained northeastwards in its northern border by the river Nahe. It has a varied aspect of wood, field and meadow. These aspects of land forms and land use are due to its underlying geological structure. The Permian marls, that make up most of the area, and the clay deposits of the Carboniferous, erode to form gentle slopes, with heights below 400 metres, with a degree of relief under 200 metres, as compared with 300–500 metres in the Haardt. Above this undulating countryside rise isolated steep-sided and thickly wooded hills and long low ridges, that consist of resistant fine grained igneous rocks. The Variscan trend (northeast to southwest) determines the lie of the hills and valleys. Minerals, such as quicksilver and copper, lie in the contact zones, but quarrying and the mining of coal are also carried on. The varied relief of the country is not favourable for routes, and the chief railways follow the valleys of the Nahe, Glan and Alsenz.

The territory of the Saar-Nahe uplands is politically divided between Prussia, the Palatinate, Bavaria and Hesse. The peasant, however, everywhere depends primarily on farming in numerous small villages, surrounded by unhedged fields. As an added means of livelihood he indulges in temporary migrations as an itinerant labourer, pedlar and travelling musician. The zone forms a routeway between French and German lands, the chief route following the depression on the south border, that is commanded by Kaiserslautern (66/156). The old castle of Barbarossa formed the nucleus of this town. It has become one of the chief centres of textile production, sewing machines and bicycles. Another group of castles commanded the routeways around the Trifels from the southern Palatinate to the Saar. Kreuznach (29,000) in the north, commanded the way into the lowland, and Homburg and Landau were established as frontier fortresses by the French, as Saarlouis was established on the Saar to the west. (Pl. 16.)

THE SOUTH GERMAN SCARPLANDS

THIS LARGE area covers the basins of the Neckar and the Main east of the Black Forest and the Odenwald-Spessart uplands, and stretches east to the edge of the Bohemian Massif, and south to the southern edge of the Swabian Jura, where it merges with the Danube plain. It will simplify the description if we confine its limits to the outer edge of the Franconian Jura plateau. Between the latter and the Böhmer Wald is the Oberfalz, that requires separate treatment since it is both a physical and human unit.

THE SWABIAN OR NECKAR SCARPLANDS (Sheet 13, Fig. 96, p. 570)

Gäue, Berge, Filder. The wooded sandstone (Keuper) hills to the southwest of the Kraichgau continue east to Crailsheim. They have various names,¹ but have the same plateau-like character, with steep scarp slopes facing north and dip slopes to the south, with average altitudes of 500 to 600 metres, and they are all thickly wooded. In these wooded uplands ran the old Roman *limes* and subsequently the east-west boundary between Swabia and Franconia. East-west routes run on the northern edge of these uplands and north-south routeways used the valley ways between them. Hence the location of the towns of Heilbronn, Hall and Crailsheim, on the northward flowing rivers where they emerge from this upland. This belt forms the northern border of Swabia. The whole area to the south is drained by the Neckar and its tributaries, and lies between the great, deeply dissected scarp of the Swabian Jura (*Alb*) to the east, and the gently rising slopes of the Black Forest to the west, all of which are markedly contrasted to the basin in land forms, land use and settlement. To the south, the zone narrows to a few miles as the Rhine is approached, and this narrow strip is drained by the upper Danube to the east and the Wutach to the south in the districts called the Baar and the Klettgau, south of the town of Waldshut.

Refer to Fig. 93 for the general relief features and to Fig. 94 for detailed geological cross-sections; to the Table on p. 51; and to Fig. 118 for a type area.

¹ Stromberg, Löwensteiner Berg, Waldenburger-, Limburger-, Ellwanger-Berge, Murrhardter-, Welzheimer-, Schurwald. See Fig. 90, p. 548.

There are three major physical features in the Neckar basin: the open lowland, developed mainly on limestone (*Muschelkalk*); the central wooded sandstone hills (Schönbuch between Tübingen and Stuttgart and the Rammert near Rottenburg) with westward facing scarps and dipping eastwards, that form the southerly continuation of the hills noted above on the northern border of Swabia; and the zone of Lias

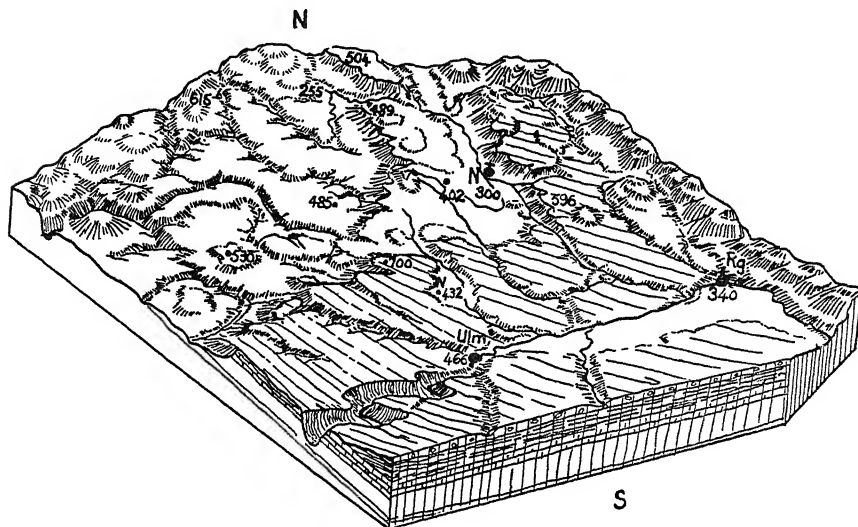


FIG. 93—BLOCK DIAGRAM OF THE SOUTH GERMAN SCARPLANDS
(from E. von Seydlitzche, *Geographie*, 1925)

Nuremberg lies in the centre of the diagram, the Danube plain in foreground. Note the main inward-facing scarp of the Jura, the Keuper-Lias Lands and the Frankenhöhe and Steigerwald; the *Gäue* plains, crossed by Main (north) and Neckar (west) and the Odenwald-Spessart Massif on the north border.

uplands and open plains that lie between these hills and the scarp zone of the Alb. The open lowlands are called the *Gäue* (*Oberes* and *Unteres Gäue*), that have various local names. The Keuper sandstone hills are the *Berge*, and the open cultivated plains of the Lias may be called the *Filder* and are separated from each other by wooded uplands or *Berge*.

The relief, however, is not the result simply of differential erosion of these gently tilted strata, to form scarps and vales. The plateau levels cut across the outcrops. The open lowland of the *Gäue* include, with the *Muschelkalk*, the outcrops of soft sandstones and marls (the *Lettenkohlen* and *Gipskeuper*), and these in turn are covered with loam or loess. The smaller valleys are sharply cut and winding in the *Gäue*, reaching depths of 150 metres with steep wooded sides. Valleys are shallow with gentle slopes in the Lias and Keuper marls, while valley sides are steep in the Keuper sandstones and the valleys covered with meadows.

Settlement. The Neckar basin lies in the rain shadow of the Black Forest and is relatively dry and warm. The Muschelkalk Gäue and the Lias plains, that are crossed by the Neckar from Tübingen, northwards along the Fils valley to near Göppingen, form the chief areas of open, hedgeless arable land, with large and closely spaced farming villages. Especially characteristic are these features on the loess deposits. Arable farming is dominant on the *Gäue*, but on the Lias zone, in the *Filder*, and on the slopes of the Keuper hills, there are also hop fields, orchards and market gardening. Downstream from Rottenburg the vine flourishes on sunny, terraced slopes. Only on the Keuper sandstone is the forest dominant. Beech, oak and spruce are the dominant trees, and the ground is often damp or marshy. In the *Gäue*, where the upper Muschelkalk is not covered by loess, the uplands are dry, with frequent patches of heath, formerly devoted to sheep rearing, that supported the early textile industry of the town of Calw. Stone walls often surround the fields, but hedgeless arable land is dominant. The villages are compact, evenly distributed, sited in hollows, and surrounded by arable fields, and still worked on the traditional three-field system of rotation. The valleys, deeply sunk to depths of some 50–150 metres below the plateau, are barriers to local communications, and the old routes followed the plateau, crossing the rivers only at bridging places. Here towns are situated on plateau edge or on valley slopes such as Haigerloch and Rottweil. (Fig. 29c.) Other market towns lie on the borders at the foot of the Keuper hills, which also were often medieval strong points, such as Herrenberg. To the south, in the Baar, villages lie on the edge of the Black Forest, but the political centre of gravity was in the middle of this little lowland at Donaueschingen, the seat of the Counts of Fürstenberg, that fell to Baden in 1805. (Pl. 26.)

The settlement is much more dense in the middle part of the Neckar basin, which forms a narrow lowland about five miles wide, developed on Lias clays. Here the presence of local industries adds to the density of settlement. The density of population between Göppingen and Esslingen reaches 280 people to the square kilometre and 200 in the Alb scarp zone. There are many small towns here. They lie along the route up the Neckar above Stuttgart that threaded its way up the Fils and over the historic Geislingen pass (*Steige*). Other towns command routes across the Alb and bridge crossings of the Neckar, and industry developed here by using the running water of the streams that flow down from the Alb.

The earlier routeways ran eastwards from the Kraichgau up the Rems valley to Nördlingen through Gmünd and Aalen. A more northerly route skirted the sandstone hills, then continued eastwards, crossing the Neckar at the bridging-place of Heilbronn. The latter was an important Imperial city, and although quite overshadowed by Stuttgart, it has

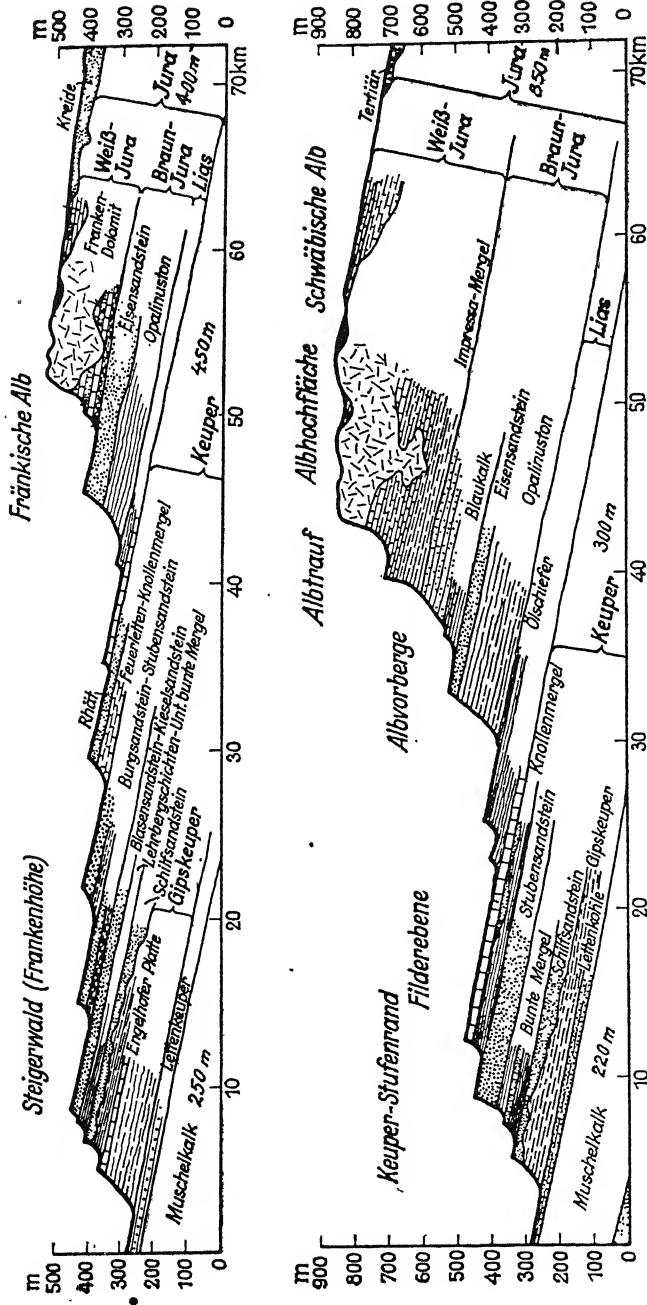


FIG. 94—GEOLOGICAL CROSS-SECTIONS OF THE SOUTHERN SCARPLANDS (after G. Wegner)

Above, west-east through the Steigerwald and Franconian Alb; below, northwest-southeast from the Keuper Sandstone Scarp (just south of Stuttgart) to the summit of the Swabian Alb. Vertical divisions give altitude in metres. Strata are named with thickness in metres.

Note. Stufenrand = Scarpe; Filderebene = Filder plain; Albvorberge = foothills; Albrauf = top of main scarp; Albhochfläche = Alb plateau surface. The White Jurassics contain the Malm limestone. The Brown Jurassic contains the Lias and Dogger clays and limestone.

become the third city of Württemberg. It enjoys navigation on the Neckar and has a variety of industries that process local products such as sugar and fruit-preserving (74/53). On this east-west route are also situated Hall and Crailsheim. The former was for long the chief source of salt for the southeast.

The later Middle Ages saw the rise of the routeways southward across the Alb, that centred to the south at Ulm on the Danube. So developed the Swabian towns on the route over the Geislingen pass and down the Neckar. In the modern period Stuttgart has overtaken and now overshadows the many small Imperial cities of Swabia. This was part of a deliberate plan to consolidate the State of Württemberg in place of the excessive political disintegration that characterized Swabia after the end of the Hohenstaufen dynasty. The dominance of Stuttgart was assisted by the construction of the railway net.

Stuttgart (Fig. 95) lies in a saucer-shaped hollow, rising up long slopes to a great belt of surrounding wooded Keuper sandstone uplands, with one wide outlet from the hollow northeastwards to the Neckar valley. Rail routes are tunnelled through the hills or concentrate in the one valley exit, while the town has spread from its nucleus to the surrounding hills. Industrial settlements cluster along the wide floor of the Neckar beyond the cul-de-sac and are separated from the town. Stuttgart reached the 100,000 mark in the 'seventies and reached 500,000 in 1939 (1946, 414,000). It has 15 per cent of the industrial population of Württemberg and another 10 per cent are located along the Neckar valley between Cannstatt and Esslingen. The city is a political and cultural centre, and has relatively few, mainly light, industries. Small industrial satellite towns reach north to Ludwigsburg, up the Neckar to Reutlingen and up the Fils to Geislingen. These industries are based on labour rather than raw material, and small-holders work in factories in the town, travelling daily to and fro. This is the region *par excellence* of *Pendelverkehr*, that has received special attention in the Württemberg Census. Many workers live ten to twenty kilometres from their work place, so that there is a dense traffic on the local railways. About 45 per cent of the dwellings of Stuttgart were damaged by bombing.

THE FRANCONIAN PLATFORM (Sheets 10, 11, Figs. 90-1)

The varied relief of the Neckar basin is more simple in the Franconian basin to the north of the sandstone hills of Swabia. The same geological sequence occurs, but the strata dip more gently eastwards, and the exposures of the two groups of Triassic strata cover a wider area from west to east. The main relief features also trend from north to south. The open, rolling, arable lands of the Kraichgau continue beyond the Neckar (be-

tween Heilbronn and the Odenwald) as a wide zone, bounded by the Odenwald-Spessart to the west, and the north-south scarp formed by the Keuper sandstones—the Franken Höhe, Steiger Wald and Hassberg—to the east. In different sectors this zone bears different regional names—Bauland, Hohenloher Ebene, Taubergrund, and, beyond the river Main, the Grabfeld. Such country extends northeast to the foot of the forested Thuringian highlands, as far as the upper Werra and Main valleys between Meiningen and Bayreuth.

The platform as a whole is framed to the east and south by the Keuper scarps that form two sides of a right-angled triangle, with its southeast

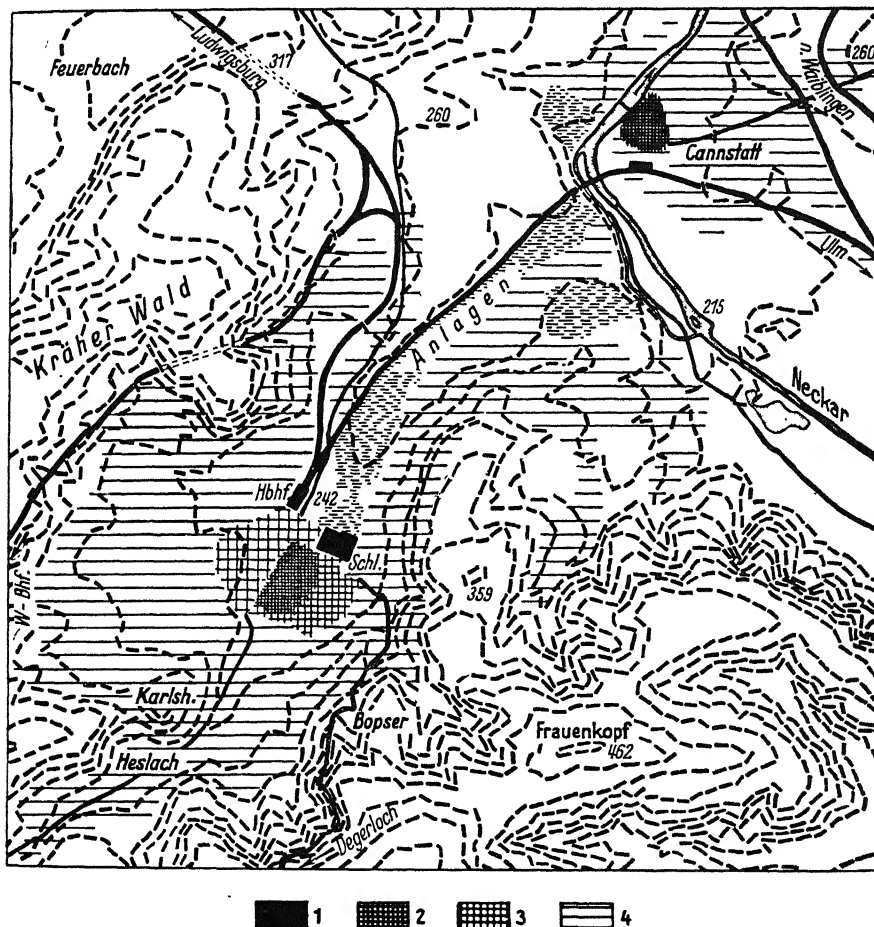


FIG. 95—THE GROWTH OF STUTTGART (from Braun) (scale, 1 : 60,000)

- | | |
|-------------------------------|-------------------------|
| 1. Altstadt about 1250 | 3. Town extension, 1640 |
| 2. Vorstadt St. Leonard, 1600 | 4. Modern growth. |

Contour interval is 20 m.

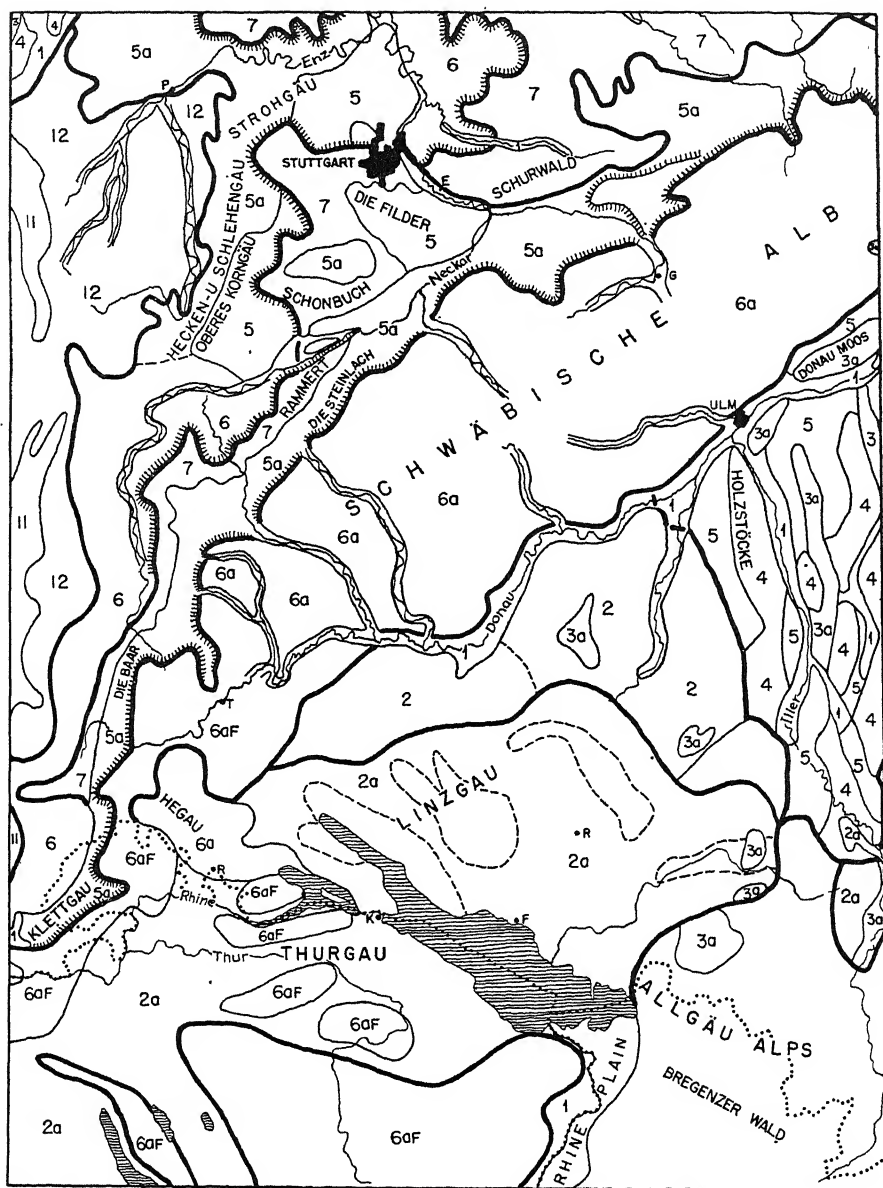


FIG. 96—TERRAINS AND REGIONS: Sheet 13. WÜRTTEMBERG

[Continued on next page]

corner at Crailsheim. This is the *Fränkische Platte*. It is an undulating plateau with altitudes of 300–400 metres, developed mainly on horizontal limestone (*Muschelkalk*) with considerable covers of loess, especially in the neighbourhood of Würzburg. It is crossed from southeast to north-west by the valleys of the Kocher and Jagst in the south, tributaries of the Neckar, and by the Tauber and the Main and the Saale in the north. These valleys have steep sides and depths of 50 to 100 metres.

Sheltered by the uplands to the west, the platform, like the Neckarland,

Fig. 96. A fan-shaped belting of terrain types radiates north-northeast and east from near Schaffhausen in the southeast corner of the sheet. These belts are:

- | | |
|--|---|
| (i) The Black Forest | (v) The <i>Schwäbische Alb</i> |
| (ii) The <i>Gäue</i> | (vi) The Danube Valley |
| (iii) The <i>Berge</i> | (vii) The Bavarian Plateau between Lake Constance and the river Iller |
| (iv) The <i>Filder</i> of the Neckar basin | |

1. *Alluvial Plains*. River valleys liable to flood. Meadow coppice and scrub and marsh or bog (*Ried*). Main areas along the Danube and the Iller.

2. *Undulating Land on Clay or Loam soils*. Mainly cultivated (arable and grass) with much woodland. Both clustered villages and dispersed farmsteads.

2a. Undulating or Hummocky Land that is morainic country with wooded hill undulating loam-covered areas with frequent patches of marsh or of cultivated land is under grass, fodder crops and wheat. Dispersed farmsteads. Hedged, walled and open fields.

3a. *Low Plateau of Sand and Gravel Moor (Bog or Fen)*. Marsh, peat-bog, meadow. Located mainly on the Bavarian Plateau south of the Danube.

4. *Low Plateau of Sand and Gravel*. Plateau strips of gravel plateau (*Deckenschotter*). Dry and sandy. Pine forest.

5. *Undulating Arable Land* on loess-loam soil. Few streams. Over 70% of the area under arable land. No hedges or ditches, little woodland. Compact villages.

5a. *Open Undulating Land with Heavy Loam soil (Lias beds): Filder*. Often with a cover of loess on a base of marl and clay. Orchards, hops, market gardening, and vineyards. Broad valleys with meadows. Open fields. Many large compact villages.

6. *Undulating Land on Horizontal Limestone Strata: Gäue*. Crossed by several wide, steep-sided valleys cut in limestone, with depths of 40–100 m. Often hilly. Open, unhedged arable land, some stone walls. Rough pasture and heath. Compact villages in hollows. Sometimes loess covered (like 5a).

6a. *Undulating High Limestone Plateau (over 800 m.): Schwäbischer Alb*. Dry limestone plateau, shallow minor dry valleys, few deep and steep-sided master valleys. Open cultivated land, with extensive heath and woodland. Compact villages sited in hollows on the plateau.

7. *Sandstone Uplands: Berge*. Undulating uplands with irregular dissected scarp zone facing west, and gradual slope eastwards. Mainly forested (oak and beech), damp and often marshy. Villages, orchards and vineyards on the lower scarp slopes up to 400–500 m. Open clearings occur on Liea loams (*Filder*).

11. *Rugged Granite Highland (600–1,000 m.)*. Deeply dissected, wooded, with many clearings. Dispersed farms and hamlets.

12a. *Dissected Plateau of Horizontal Sandstones*. Deep, steep-sided valleys up to 300 m. deep. Rounded ridges up to 1,000 m. Thin sandy soil. Forested (spruce and bog) with little clearing. Dispersed farmsteads and small hamlets in the bottom of valleys.

12b. *Dissected Plateau of Horizontal Sandstones*. Large expanses of smooth plateau, 500–700 m., few deep valleys. Loam soils. Fir and beech forest. Many cultivated clearings with compact linear villages.

Note. 1. Heavy line north of the Linzgau should be a fine line between Terrains 2 and 2a.

2. Dashed lines north of Lake Constance enclose moraine-covered hills.

3. In Terrain 12, the northwest (west of the Enz Valley) should be 12a, and the remainder 12b. Both areas of 11 should be joined up as one area.

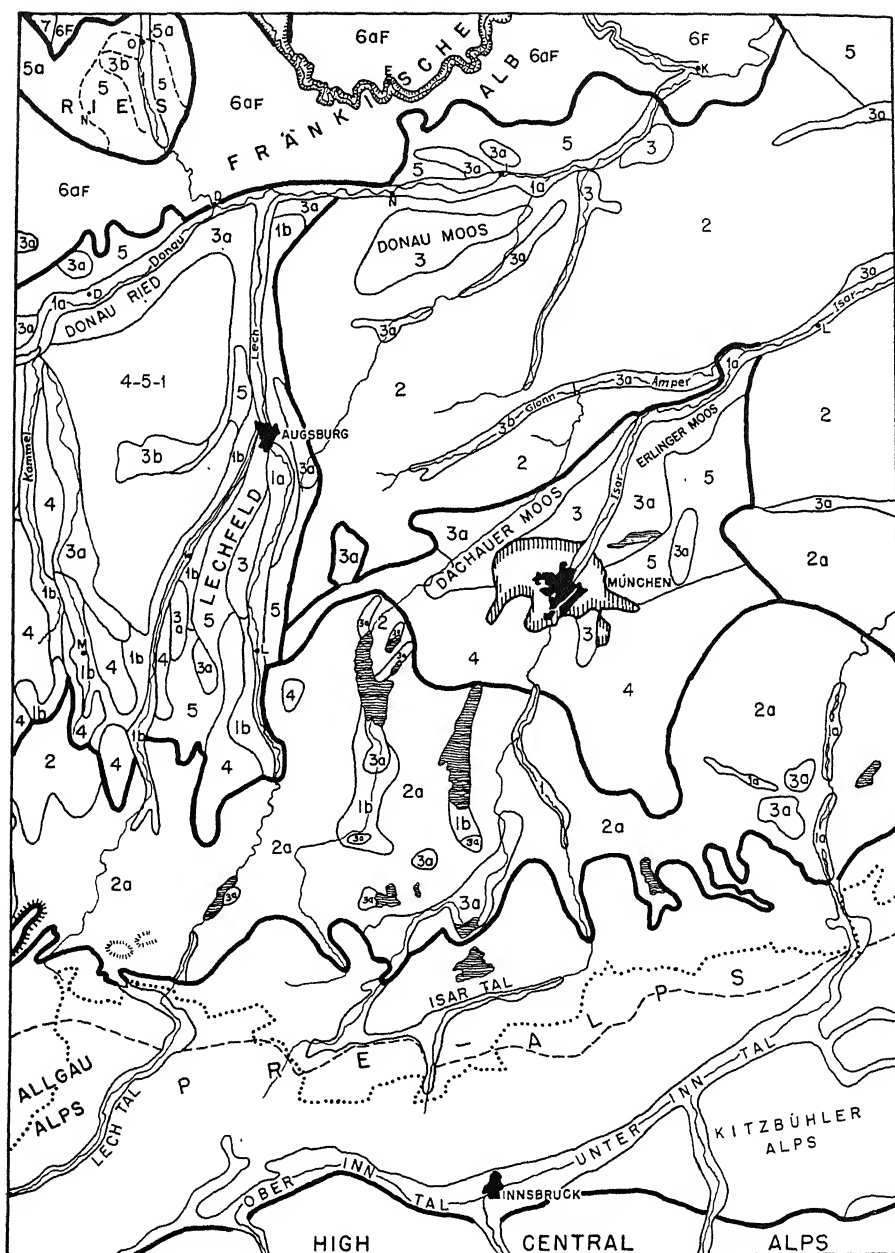


FIG. 97—TERRAINS AND REGIONS: Sheet 14. SOUTHERN BAVARIA

[Continued on next page]

is a dry rain-shadow zone, with an annual rainfall of 60–80 cm. with 40–50 cm. in a belt through Schweinfurt-Würzburg-Nuremberg. Remains of the *Steppenheide* flora are frequent over the whole area as Gradmann's maps show¹ and the woodlands have the beech as their dominant tree.

¹ See the simplified versions in East, *Historical Geography of Europe*, pp. 52–3.

Fig. 97. This sheet covers from north to south:

- | | |
|---|--|
| (i) The limestone uplands of the Fränkische Alb | (iv) The Bavarian Pre-Alps and, finally, on the southern edge of the sheet |
| (ii) The meadow and bog of the Danube valley | (v) The High Central Alps |
| (iii) The Bavarian plateau, passing through the zones of older and younger moraines | |

1. *Alluvial Plains*. Two distinct types are shown:

- (a) The river flood-plain of the Danube and its southern tributaries. Sand and gravel soils. Reeds and scrub (*Auenwald*), comparable to the *Ried* of the Upper Rhine Plain.
- (b) Slightly higher flat land (the low terrace or *Neiderterrasse*) with loam soils and open arable land. Compact villages. This often merges into the bog areas (3 below).

2. *Undulating Land* on horizontal soft sandstones (*Molasse*) and old morainic deposits. Clay or loam soils. Patches of drained bog. Meadows in valleys. Mainly cultivated with much woodland. Both clustered villages and single farmsteads are intermingled.

2a. *Undulating or Hilly Land*. Recent morainic deposits with low hills (drumlins) and flat land. Loam soils with frequent areas of marsh and bog. Wooded hills are indicated by dashed lines.

3. *Level Land with Sands and Gravel soils: Heathland*. Small extent on the plain around Munich and the Lechsfeld south of Augsburg (*Niederterrassechottenfeld*).

3a and 3b. *Flat Land with Sand and Gravel soils: Peat Bog (Moor and Moos)* and meadow (*Ried*). Main areas along the Danube, but numerous small patches throughout the areas south of the Danube. 3a. Uncultivated bog. 3b. Peat cuttings with drainage ditches, cultivation, and settlement.

4. *Flat Land with Sands and Gravel: Forested (conifers)*. Plateau strips of gravel (*Deckenschotter*) west of Augsburg. Low terrace of glacial gravels in the plain south of Munich.

5. *Undulating or Flat Land on Loess-Loam soil*. Predominantly open arable land with compact villages and close network of tracks.

Note. The *Ries* flat open arable land on loess soils lies west of the river Wornitz and sandy soils to the east of it.

5a. *Open Undulating Land with Heavy Loam soil (Lias beds): Filder*. Orchards, hops, market gardening, and vineyards. Open fields. Many large compact villages.

6. *Undulating Land on Horizontal Limestone Strata: Gäue*. Crossed by several wide, steep-sided valleys, with depths of 100 to 150 m. Open, unhedged arable land, some stone walls, tough pasture and rough pasture and heath. Compact villages in hollows. Sometimes loess covered (like 5a).

Undulating Land on Horizontal Limestone Strata: Fränkische Alb. Scarp faces north beyond the edge of the sheet, with long dip slope to the south to the Danube. Thin loam soils. Heavily wooded with heathland. Deep steep-sided and wide master valleys.

6a. *Undulating High Limestone Plateau (over 800 m.): Schwäbische Alb*. Dry limestone plateau, shallow minor dry valleys, few deep and steep-sided master valleys. Open cultivated land, with extensive heath and woodland. Compact villages sited in hollows on the plateau.

13. *Urban Terrain*. The compact built-up area is shaded in vertical lines and the outer areas in horizontal lines.

Note. Garmisch lies north of the letter "E" in "Pre-Alps". The Zugspitz lies on the letter "E".

The main forest-free areas in A.D. 500 lay in the loess area astride the middle Main (Würzburg-Schweinfurt) and the Grabfeld, north of Schweinfurt. It was a zone of prehistoric settlement and movement, and a zone of early Germanic settlement, a natural zone of movement between wooded lands to north and south. Routes from the Kraichgau and beyond ran northeastwards across the Thuringian highlands, and through the Meiningen gate on the Werra to Hesse and Thuringia, around the northern end of the Thüringer Wald; and southwards, on either side of the Franconian Alb through Bayreuth and Bamberg. Medieval routeways radiated westwards from Nuremberg to the Main and the Neckar valleys through the Odenwald-Spessart.

The landscape throughout presents a mosaic of open, unhedged, arable lands with clustered villages on the level plateau, and steep-sided valleys, whose slopes are covered with forest, vineyards and orchards, with meadows along their floors. These are respectively the *Gäue* and the *Grunde*. The plateau has a thin soil, developed on its level limestone surface, and its valleys are shallow and dry. The main valleys are sunken in the plateau and are often imperceptible across its level surfaces. The valleys are well sheltered, mild in winter, but dry and dusty in summer. Woodland covers a quarter of the whole of the *Platte*, while over a half is under arable cultivation. Meadows occur only in the narrow strips along the valley floors. Vineyards and orchards have displaced the heath flora on the valley sides. On the plateau three-quarters of the land is under arable, the chief crops being barley, wheat, spelt and potatoes. The name *Bauland* speaks of this fertility. The three-field system (*Gewannflur*), with compact villages in hollows, characterize the plateaus, while congested towns and villages are closely spread in the valleys on their lower slopes (see Pl. 30). Rural habitations suited to the economy of the vintner in the valleys stand in marked contrast to the large Frankish farmsteads of the arable lands on the plateau. Vineyards are often terraced, and bounded by high, thick stone walls, and the holdings are very small, worked with the hoe rather than the plough. Industries are of little importance in its small, but historic towns, that have been little affected by modern urbanism. The Main is used today for floating timber downstream. Its former importance as a highway is reflected in the historic trade of some of its towns, that imported wares upstream and distributed them throughout Franconia. There has also been a shift in the land routes, for the railways prefer the valleys, and by-pass most of the historic towns that lie either on the rivers or at the foot of the Odenwald-Spessart and on the Frankenhohe. The extreme territorial division of these lands also prevented any one town from dominating the rest.

Würzburg. This city is one of the great ecclesiastical cities of Germany and the main market centre of the northern sector. It is situated

at an outstanding focus of routeways at a crossing of the Main. Through it ran the important overland route from the Kraichgau to Thuringia, on which, too, lay Schweinfurt (36,000) whose growth was checked by the superior facilities of Würzburg (101,000). Würzburg was established as a bishopric in the eighth century, and remained a great ecclesiastical centre. The temporal powers of its prince-bishops extended over the middle Main basin (roughly in the open, loess plains, bounded by wooded hill zones), until the abolition of these powers and the absorption of the Würzburg and Bamberg bishops' territories in Bavaria in the early nineteenth century. Fortified villages and castles speak of the medieval political disintegration on this great routeway. Baroque castles and pilgrims' churches often reveal marked Italian influences in their architecture, and bear witness to the strength of the prince-bishops of Würzburg in the eighteenth century. The city suffered badly from bombing and in 1946 had only 55,000 people.

The *Upper Werra and Main Valleys*, though part of the Main lands, form a distinct, though complicated area (Fig. 91, p. 550). This is a trough from northwest to southeast, commanded at its extremities by Meiningen and Bayreuth. It lies between the Thuringian Forest and the uplands of the Hohe Rhön and the Franconian Alb, and is drained by the upper Werra to the north and by the Roter Main in the south. Its Triassic rocks dip steeply, since they were involved in the faulting of the Thuringian block, and through differential erosion yield a diversified relief. Resistant sandstones and limestones stand out as steep-sided wooded hills, such as the Langen Berge, and fertile open lowland lies on the limestone and marls especially where these are covered with loess. On the latter, the arable three-field system is found, together with remnants of the steppe-heath flora; this is the nucleus of the Henneberg Land that is a direct continuation of the Grabfeldgau. The upper Werra valley was always associated with the dukedom of Saxony and its successor, the Land of Thuringia. It contained two distinct and old-established units, the counties of Henneberg and, south of it, the county of Coburg. The highland has never served here as a barrier, but rather as a link. Meiningen (18,000) is an old residential town of the Thuringian nobility, and, economically, the valley is closely related to the Thuringian Forest. Sonneberg (20,000), that lies at the foot of this highland and serves both it and the lowland, is the chief seat of the world-renowned toy-making industry. Oberfranken includes the southern section that is drained by the upper course of the Main, and has its focal town in Bayreuth (35,000). This area was long associated politically and economically and culturally with Bamberg and Nuremberg, and is emphatically Franconian in character. The old political provinces extended east into the Frankenwald with which the valley is closely related, as is evidenced

by the fact that the small towns have industries like those of the highland.

THE FRANCONIAN SCARP AND THE MIDDLE FRANCONIAN BASIN

The north-south Keuper scarp lies east of the Franconian platform from the Franconian Saale in the north to Crailsheim in the south. Eastwards from the scarp the wooded uplands slope gently to the basin of the Rednitz, which in turn is bordered to the east by the north-south dissected scarp zone of the Franconian Alb (Fig. 91, p. 550).

The scarp is known from north to south as the Hassberg, Steiger Wald and Frankenhöhe, and has a steady average altitude of just over 500 metres, rising only some 70 to 100 metres above the limestone (*Muschelkalk*) platform, while lowland bays, eroded in the soft marls (*Gipskeuper*), break up the low scarp and leave outliers beyond the main scarp front. The deepest of these embayments, twenty-five kilometres deep, is that in which lies Windsheim. North of Iphofen the scarp is much higher, reaching 200 metres. The gentle lower slopes in the gypsum marls, covered with vineyards and orchards, merge upwards into the steep sandstone scarp (*Schilfsandstein*), in which are great quarries. Then comes a zone of marls (*Bunter Mergel*), and finally, at the top, the forested capping of resistant sandstone of the plateau top (*Plattensandstein*) (Fig. 94)

Gently undulating surfaces, traversed by wide flat valleys trending eastwards, and a continuous cover of forest, stretch towards the river Rednitz, changing gradually from the dissected scarp zone. The degree of relief is under 100 metres. Coniferous forest is dominant on the Keuper sandstone, while in certain areas, as in the Aisch valley, impervious rocks are strewn with numerous lakes and streams. Only occasionally does a residual sandstone hill rise above this forested, damp lowland. The Nuremberg basin east of the Rednitz valley is flat land, with low residual hills of Keuper sandstone, such as the hill site of the castle of Nuremberg. Most of this plain is covered with low glacial sands, terraces and dunes, and is thickly and almost completely covered with pine forest. In the eastern part of the basin the Lias plains are open and cultivated as in Swabia and form rich lands around Bamberg and Forchheim.

This *Middle Franconian Basin* has land uses that stand in marked contrast to those of the Franconian Platform. Forest covers 40 per cent of the Hassberg, and 50 per cent of the north Steigerwald. Meadow and pasture are rare, and crops, such as rye, potatoes and buckwheat, are dominant. The vine is absent, but hops are important in the valleys and on the edge of the Jura; Nuremberg is the centre of the south German hop trade. Wheat is grown only on the rich clays. Market gardening is carried on near Bamberg and apple orchards occur frequently in the

Main valley. The higher parts of the Keuper lands were deforested at a late date and are thinly peopled. In the inner Steigerwald, three-quarters of the settlements have less than 150 inhabitants each; population stagnates and is even decreasing.

The Rednitz valley seems to have been settled in prehistoric times, but was abandoned during the *Völkerwanderung* and the suffix *heim* only appears north as far as Forchheim. Forest grew again and formed the boundary against the Slavs. German settlement was slowly effected in Middle and Upper Franconia in medieval times by the counts of the *Nordgau* and then by the bishops of Bamberg. Thus, the settlements were established late and have often grown from small hamlets. The lowland to the west served as a thoroughfare to the Danube, and here in the later Middle Ages there grew small territorial lordships and many Imperial cities, which have retained their historical aspect and are little changed, since they are away from the main avenues of modern traffic (Dinkelsbühl, Windsheim). They are small and declining. The complicated pattern of medieval lordships is also reflected in a modern territorial mixture of religions. Most of these territories were finally absorbed in the ecclesiastical territories of Bamberg and Eichstatt, the Ansbach-Bayreuth possessions of the Hohenzollerns, and the free Imperial city of Nuremberg. The present political division of Bavaria, that emerged during the Napoleonic occupation, closely follows these historical units, for the area belongs partly to Oberfranken, Mittelfranken and Oberpfalz.

The chief towns lie on the north-south axis of the Rednitz valley. This routeway was canalized by Charles the Great, and is now being used for a main canal to link the Main and the Danube. Weissenburg (8,000) is at the southern entrance, Schwabach (11,000) and Fürth (78/95) belong to the Nuremberg industrial complex, that also embraces the university town Erlangen (30,000) and Forchheim (10,000). At the northern end of this series is *Bamberg* (56/74), the old bishop town, situated at the junction of two, formerly navigable, rivers and of road routes. It is the third largest town on the Main, but like Würzburg, it has little modern industry and has preserved its historic character with a wealth of Baroque secular and ecclesiastical architecture.

Nuremberg had its beginnings in handicrafts for which timber and running water of the environs were used, while development was favoured by special privileges accorded to the craftsmen by Frederick II. It lies at the centre of the Rednitz basin and was able to serve as a focus for radial routes and satellite craft-towns, and established wide connections across the Alps with Italy, with Bohemia, and northwards with northern Germany and Flanders, the Rhinelands and beyond. The mercantile era reduced the sphere of its trade contacts and even the customs union of 1834 could not make up these losses, for the city was lacking in iron and

coal. The production of fine metal-wares plays a main part in its modern industrial structure, although it has latterly attracted heavy engineering industries in virtue of its good railroad facilities (pencils, boots, shoes, toys and confectionery). In the days of Albrecht Dürer it had 30,000. In 1939, together with Fürth, its population was 500,000 (1946, 407,000).

THE FRANCONIAN AND SWABIAN ALB (Sheet 11, Fig. 91)

A great plateau of horizontal Jurassic limestones, averaging some forty to fifty kilometres in width, stretches, as an inverted letter L, from the great northward bend of the Main in the north to the Hegau beyond the headstreams of the Danube. It falls into two sections, the Fränkische Alb in the north and the Schwäbische Alb in the south, the area of contact between the two being the roughly circular depression known as the Ries, whose central town is Nördlingen. It is nowhere above the climatic limits of possible settlement, but it is barren and thinly settled highland, and forms a wide divide between the lower lands that border it in the drainage basins of the Neckar and the Rednitz and the Main to the north, and the Danube and its tributary the Naab to the south.

The plateau is built of strata that dip imperceptibly eastwards and southwards. (Fig. 94, p. 567.) These include, from the base up, the fertile Lias lands of the Neckar lowland, through the Dogger series, that form orchard-covered hill slopes, thence upwards to the first scarp or hill outliers formed by the resistant ferruginous sandstone (*Eisensandstein*). Above this follow soft and impermeable strata and these form an important spring line. Above this comes the higher scarp that is formed by the Malm limestone, that is often broken into two steps by a zone of soft marls. But the main scarp is formed by the great thicknesses of dolomitic limestone (*Massenkalk*), 300 metres thick, and the *Plattenkalk* above it. These limestones form the basis of the plateau, which is, in consequence, waterless and often karstlike. The rivers in the main, small though they are, follow deep, steep-sided troughs with sources beyond the plateau. They form the base level for the drainage of the plateau itself, and when waters issue on the soft beds at the foot of the Malm limestone, embayments have been eroded in the Jurassic wall. Residual hills beyond the main scarp bear evidence of active erosional recession of the scarp.

The wooded scarp zone stands in marked contrast to the intermixture of wood, rough grass and stony cultivated land on the plateau. But the lack of dense forest and relatively open country drew prehistoric settlers to this habitat. Indeed, the *Steppenheide* formation, with relicts of Alpine flora, occurs on the dry limestone soils. At an early stage men preferred the richer and more accessible soils on the periphery of the high, exposed plateau. North of the *Limes*, as in Middle Franconia, settlement ceased

after the La Tène period in the Later Iron Age, and began there anew in the Middle Ages.

The Franconian Jura in the north presents a semi-circular dissected scarp zone stretching from Bamberg to Bayreuth, but to the south the plateau slopes imperceptibly eastwards to the Oberpfalz. Flat, stony surfaces are developed on the Malm limestone, but more hilly relief develops on the Franconian dolomitic limestone (*Massenkalk*). Numerous low hills are intermixed with dry valleys, swallow holes and dolines, formed by underground subsidence, but further east, on the Cretaceous sandstones, the surface is more uniform and there is a forest cover of firs. Limestone crags and hills are capped by castles and small towns that are still fed by cisterns or water carried or raised from the valleys below. These features are especially characteristic of the *Fränkische Schweiz*, and give to it its special attraction to tourists. Juniper heath and poor stretches of arable land stretch over the plateau. Large settlements are confined to the margins where running water for power is available. The smooth-surfaced plateau is cut by only a few valleys and only when the surface drainage reaches the water table beneath the Dogger limestones does water appear on the surface and normal surface erosion proceed. The dry valleys have loam soils, and hamlets and dispersed farms lie amidst the cultivated fields. Density of population is low (40 per sq. km.). Eastwards, towards the Naab and the Danube, the Tertiary cover results in greater fertility and closer settlement, although the relief is diversified by erosion.

The *Ries* (Fig. 97) is a depression 400–430 metres in altitude and about 20–25 km. in diameter, with its focus in Nördlingen. It is surrounded on three sides by limestone scarps, and drained southwards by a small river, that cuts through about ten kilometres of the plateau to reach the Danube at Donauworth. Geologically, the Ries is complicated, the horizontal rocks of the plateau periphery, in a ring five to ten kilometres wide, being disturbed and intermingled with tuffs and volcanic ashes. This volcanic activity was due to sudden earth movements, with associated vulcanicity, immediately before the Upper Miocene, and earthquake tremors indicate that the movements have not yet ceased. It would seem that the Ries as a whole is comparable to a great explosion crater or *Maar*.

The Ries is a productive arable land and is thus markedly different from its plateau surroundings. It is also an important historic routeway from north to south from Würzburg and Nuremberg to Augsburg, although the shift of the main routes eastwards to Munich in the later Middle Ages and the construction of main railways to east and west have caused the sidetracking and stagnation of Nördlingen and its neighbours. But the Ries was settled in prehistoric times and most of its villages have *ingen* and *eim* suffixes. It was an early and important seat of

grain production. Its density of rural population is twice that of the plateau and its villages are situated about 2 to $2\frac{1}{2}$ km. apart. Nördlingen (8,500) is one of the best preserved historic towns in Europe, its circular walls containing many old houses on the framework of a radial arrangement of streets centred on a focal market place.

The Swabian Alb (Fig. 96, p. 570) stretches west of the Ries, with a width of 40 km. and a length of 130–140 km. It is a high plateau divided into blocks by several valley troughs that traverse it from north to south, with depths of 500 to 800 metres. Most important of the historic highways is the Geislinger *Steige* (582 metres) that climbs over the plateau from Geislingen to reach Ulm, the chief focus of routes across the plateau to the Danube. The crossing of the Alb is here reduced to 25 km. by the deep northern incision of the Fils valley below Geislingen. The climb from the latter is 160 metres in 5 km. and then continues on the plateau along the dry valley 120 metres below the adjacent plateau. West of the Geislinger *Steige* the plateau stretches for 70 km., without interruption, with a width of 40 km. The Alb as a whole is a dry limestone plateau, with dry valleys and karstic features. Wood is rare and stony soil and poverty-stricken heath predominate on the higher parts, with arable land concentrated in the valleys. The plateau is windy and exposed, and trees line the roads and the widely spaced nucleated villages are situated in hollows. Water was formerly obtained from cisterns, although it has been drawn since 1870 from a piped supply. The poor pastures are used for sheep and there is not enough pasture in the valleys for cattle raising. In spite of a small linen textile industry as an additional source of livelihood, the population is small and decreasing. The Alb north of Ulm is more productive since here there is a lower altitude and a loam (loess) soil. This distinctiveness is evident in the *pays* name of *Hochstrass*.

The scarp slope to the northwest, when viewed southwards, appears like a great wall. Its main scarp, however, is bordered by many residual outliers with steep-sided valleys between (see Fig. 94, p. 567). At the foot of the steeper slopes are orchards, and above these fine beech woods, above these again are the white cliffed exposures of limestone rocks. This dissected scarp zone forms a belt of deeply interlocking hills and valleys and plateau remnants with a width up to four miles in depth lying between the main plateau scarp and the Lias Clay Vale.

Within this dissected zone there are narrow plateau strips isolated conical hills, and flat-topped hills with steep sides, separated by many short, gorge-like valleys. The flat-topped hills are outliers of the main plateau to the southeast and are formed of horizontal limestones overlying alternating beds of sandstones, limestones and clays (Brown Jurassic series). The summits of the hills rise to heights between 500 and

750 metres, the general elevation increasing southeast towards the main scarp. The hills and upper scarp slopes are covered with beech and spruce woodland, the lower slopes and the valley floors have orchards, arable land and pasture on their more productive loams and clays, and on southward facing slopes vineyards reach up to 500 metres. Large compact villages surrounded by orchards and cultivated land lie in the open valleys and on the lower slopes. Many of the isolated hills command extensive views of the countryside and some are capped by castles, a notable example being Hohenzollern castle, south of Hechingen, that stands on a wooded conical hill 650 metres high. The running water supplies power for industry in many small towns.

South of the Danube the Alb narrows towards the Rhine. Here the series of the middle and upper Jurassic strata form the Randen plateau, with its scarp facing the Wutach valley beyond which lies the crystalline massif of the Black Forest. The valleys in this area reach down to the easily eroded (Malm) deposits and the area is fairly well settled. The trough of the Wutach valley is continued beyond Waldshut beyond the Rhine along the northern border of the Swiss Jura, the continuation of the Swabian Alb.

This southwestern corner of Germany contains several old *pays* that include sections of the lowlands and of the Jura. These are the Klettgau, that lies along the Wutach valley and includes the Randen plateau and the edge of the Black Forest; the Baar, that embraces the plateau country centred on the upper Danube above Immendingen; and the Hegau, the lowland to the northwest of Lake Constance that is studded with isolated volcanic hills (Pl. 29). Politically, before 1800, this area was very divided. The *Landgrafschaften* of Baar and of Klettgau, the ecclesiastical territory of St. Blaas, were among the chief of these independent small territories, sandwiched between the Habsburg lands of Breisgau in the south of the Black Forest, Württemberg in the Neckar basin to the north, and the Swiss confederation to the south. The names persist in the *Volksmund* to this day.

OBERPFALZ OR UPPER PALATINATE LOWLAND (Sheet 11, Fig. 91)

The Upper Palatinate is drained southwards by the Naab and lies between the Franconian Alb or Jura and the Bohemian Forest. The Naab traverses a Keuper marl lowland about twelve kilometres wide between the Jura and the crystalline Bohemian Massif. Occasionally the monotonous level surface of the sandy deposits is broken by basalt hills and the outcrops of underlying red sandstone (*Rotliegendes*). The crystalline highlands to the east, however, are marked by a sharp break of slope and change of surface. Much of this lowland is covered with impervious

clays that are strewn with lakes and covered with forest, a countryside that reaches north to the watershed of the Eger and Naab at 500 to 600 metres.

The Oberpfalz is infertile and unproductive farmland so that it has a low average density of population. Its economy is comparable with that of Middle Franconia. Population is stagnant and towns few and small, their medieval growth being due in particular to the activities of small market towns that were founded adjacent to late medieval castles. The ceramics industry has brought a little revival to those towns in recent times. The area is isolated and the Naab valley alone has offered a through north-south route by which the Bavarian people and the political control of Bavaria (of the Wittelsbachs) spread northwards.

Bohemian Forest (Fig. 4). The *Böhmer Wald* and *Bäyrischer Wald* are separated by the northwest to southeast fault trough of the Regen valley known as the *Pfahl*. Valleys are often wide and shallow and the ridges tilted horst blocks, with steeper slopes to the southwest and gradual slopes to the Bohemian side to the northeast. These features are characteristic of the highlands on either side of the Regen trough. The general peneplain level here is about 700 metres and only a few outstanding points reach over 1,000 metres. A lower peneplain level is 400 to 500 metres high and it is this surface that borders the Danube and at Vilshofen reaches across the Danube, where the gorge at Passau is incised. The level of the Pfahl depression is about 500 to 600 metres. In the *Vorderer Wald* the forests are broken by meadow, field hamlets and isolated farmsteads. The *Hinterer Wald* is higher and more continuously forested and thinly settled. The latter with a maximum height of 1,457 metres overlooks the deep, forested trough of the Regen to the south. Depth of dissection reaches a maximum here of 800 metres and has an average of 400 metres. The highest points rise 300 to 400 metres above the main plateau that is about 1,000 metres high. The highest points are broad-backed ridges though they are deeply etched by lake-filled cirques on the north and east slopes, that are evidence of the small glaciers that covered the highest altitudes. The Furth gap affords a route across this barrier with an altitude of 470 metres. It is a trough 15 km. wide, and is today followed by the rail from Munich to Prague.

These highlands have a severe and wet climate. Snow reaches depths of ten feet and lies for months, and there are 200 days of frost. Spruce forest is dominant and tree-felling and woodworking is often the only occupation of the small scattered timber-built settlements. German colonization did not reach here until the tenth century on its borders, and the twelfth century in the interior and ended on the Bavarian side in 1450. Germans occupy the both sides of the main highland and Slavs have penetrated into the Furth gap, though they took no part in the pro-

cess of forest clearance. Mining, the main attraction of the medieval settlement, has long since died out, and timber felling, the mining of graphite and glass-blowing have attracted a little later settlement. But there is more industry on the Bohemian than on the German side. Routeways across the highland are negligible in history except for the Furth gap and the political frontier (that lies on the eastern side of the highland) has been a more effective human divide than the forested highland itself.

The East Bavarian Highland includes the Frankenwald and the Fichtelgebirge.

The *Frankenwald* (Fig. 91), which rises some 200–300 metres above the Oberfranken lowland west of it, is an undulating and barren highland, developed on a peneplain of gneiss and schists, and surmounted here and there by low residual ridges. Small hamlets lie in the clearings, surrounded by heath, bog and forest. Houses have slate roofs and timber frames protect the railway tracks from the drift of winter snows. To the east the plateau slopes gently to the Vogtland. The small streams occupy broad, shallow, mature valleys and many are dammed to form small lakes. To the north the rivers gradually become more deeply incised and often are barriers to communication. The boundary of Bavaria runs through this zone of dissected relief. Hof (41,000) lies in one of the broader valleys at a point where the Saale can be crossed for the last time and local valleyways converge here with a northerly outlet to the Leipzig Bay. Hof is a railroad focus and an industrial town. The Autobahn from Nuremberg to Dresden also passes through it.

The *Fichtelgebirge* is a rectangular plateau block at the convergence of the Thüringerwald, Frankenwald and the Erzgebirge. This undulating plateau, covered with forest, lake and bog, is crossed by routes that formerly were commanded by the Bohemian town of Eger. Today two main railway lines cross it from Nuremberg to Eger and from Leipzig to Munich via Hof, the latter avoiding the Bohemian territory by crossing right over the plateau. The area is not a barrier. Horst blocks trend southwest to northeast and northwest to southeast and where the two directions converge are the highland masses, reaching heights of just over 1,000 metres (Schneeberg and Ochsenkopf). These highlands, horse-shoe shaped, surround the lower platform (480 to 680 metres) in which the main radial streams rise and drain eastwards to the Eger. But the same rock surface occurs throughout. Bare gneiss and granite rocks, spruce forest and bog, and indeterminate watersheds characterize the higher lands (marked 10 on Fig. 91), while the interior (8 on Fig. 91) is under arable and meadow land, since the forest was cleared in the late Middle Ages. This settlement reached the area from all directions along the easy routeways through the surrounding highlands. Pastoral

economy dominates and the high density of population is to be attributed to industry—rather than farming—the treatment of timber, and the quarrying of rocks. Weaving is also pursued and connects the area economically with the Vogtland to the north. Selb (13,000) is the chief town.

CHAPTER 23

THE BAVARIAN PLATEAU

GENERAL: PHYSICAL (Fig. 4, pp. 24-5)

THIS AREA stretches from Lake Constance in the west to beyond Linz on the Danube in the east, where the edge of the crystalline uplands of the Bohemian block approach the foothills of the Alps. It is triangular-shaped, with its base on the east-west front of the Alps and its second and third sides on the Danube against the Swabian Alb and the Bohemian Massif. The Danube in general flows along the southern border of the Alb and the Bohemian Massif, although, owing to the shifts of its course and its antecedence to most recent uplift, it cuts here and there into the solid rocks of these two northern areas. Geologically and physically, however, this belt of country is continued beyond Lake Constance into the Swiss Plateau and across the Vienna lowland, to form a zone on the outer side of the Alps and Carpathians.

The term Bavarian or Alpine Foreland refers to the fact that this area occupies the site of a great, deep, downfold that was the counterpart of the upfolding of the Alps. It was, in other words, a geo-syncline, in which there were laid down materials brought from the Alps, such deposition taking place as the syncline itself was sinking. The folding pressure was greatest adjacent to the Alps and least to the north. Thus, the deposits reach great depths and near the Alps are coarser and were often folded in accordance with the folding forces of the Alps, whereas further from the Alps deposits become finer and are much less disturbed. The sinking of the trough caused flexures or faults on its edges to the north and south. Borings indicate that these late Tertiary deposits have depths of 1,800 metres. In Switzerland they reach depths of 2,500 to 3,000 metres. Sands and clays (Oligocene and Miocene) alternate and become coarser nearer to the Alps. These are the so-called *Molasse* deposits. The coarser deposits have been converted in Switzerland into conglomerates that were involved in the Alpine folding and form mountain masses on its border; these are the *Nagelfluh* deposits. In the eastern section of lower Bavaria the deposits of the Tertiary hill-country are fine sands and clays (*Flinz*), whereas in the Swiss plateau sandstones and conglomerates dominate and give a more hilly relief. The general uplift of the areas nearer the Alps resulted, even during the deposition of the *Molasse*, in greater erosion. Thus, the erosion surfaces were developed

not on horizontal strata of accumulation, but across the grain of slightly tilted and uplifted strata. Across this pre-glacial surface, streams flowed north and northeastwards to the Danube that was steadily pushed northwards. As the whole of the foreland was gradually uplifted, so the Danube cut its narrow course on the northern edge through the margins of the Alb and the crystalline rocks of the Bohemian Massif. The axis of subsidence seems to have shifted later a little to the south, so that the Danube was drawn to the zone of depression and thereby forsook part of its course in the Alb. Such abandoned valleys are the Blautal and Altmühl.

The northward movement of the ice and the deposition of fluvio-glacial deposits as the ice retreated to the Alps blanketed much of this pre-glacial relief, so that these more recent deposits account for the main surface features of the present area (Fig. 98). The northern limit of the glacial deposits affords a primary division of the foreland in terms of its relief into a southern and a northern section, that are separated by the northern limit of glaciation as revealed by terminal moraines. West of the Iller river, indeed, the moraines of the extended Rhine and Rhone glaciers covered the whole section north to, and even beyond, the Danube, to the Swabian Alb. Lake Constance forms the centre of a great arc-like lobe, based on the Alps, that stretched from the Iller to the Swiss canton of Lucerne. Further to the east, the glaciers in the valleys of the northward flowing Iller, Lech, Isar, Inn and Salzach formed a continuous morainic belt, with semi-circular terminal moraines bulging northwards to a distance of fifty kilometres from the Alps. Fluvio-glacial deposits were laid down in front of, and between, the valley lobes, so that the old Tertiary hill country remains exposed only north of a line from Augsburg to Freising to Muhldorf (on the Inn). Between the Iller and the Lech rivers west of Augsburg the outwash deposits reach north as far as the Danube. They contain the so-called *Deckenschotter* or plateau gravels. These form level plateaus, seamed by many parallel north-south valleys, on whose floors and slopes the underlying Tertiary beds are exposed. Greater uplift and stronger erosion in the Lake Constance area caused these beds to be almost entirely removed, whereas east of the Lech, owing to depression, they are covered by younger beds.

The distribution of diluvial (or glacial) and Tertiary deposits account for the main relief features. Between the Lech and the Salzach the glacial deposits are in the south sector and the Tertiary deposits in the north. Nearer the Alpine front Molasse sandstones and Nagelfluh conglomerates outcrop and have affected glacial erosion. West of the Lech the two are intermixed. Molasse masses were covered by the ice and plastered with moraine (as in the Kempten Wald); or they lay above the level of the ice and today separate the moraines of the Rhine and Iller (Schwarzer Grat). In the Allgäu, the Molasse was partly sub-

merged by the ice and partly lay above the level of the ice; this holds, too, for the Hegau at the western end of the Lake Constance as well as generally in the Swiss Plateau. Hill features are thus due to the molasse sandstones, which were buried by the ice at its maximum extent, but blocked the northward flow of the ice, and the ice moved around them and moulded the valleys.

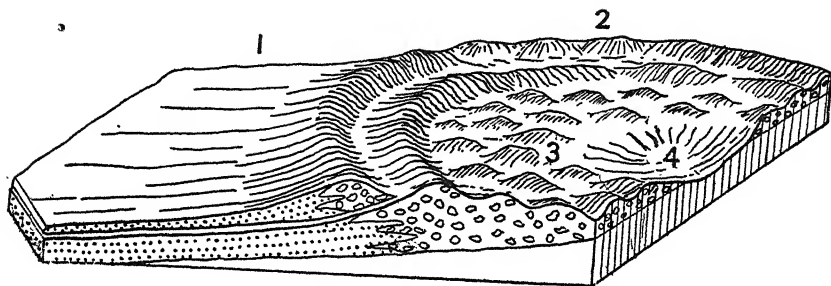


FIG. 98—BLOCK DIAGRAM OF THE BAVARIAN (PLATEAU OR ALPINE) FORELAND (from E. von Seydlitzsche, *Geographie*, 1925)

- | | |
|---|--|
| 1. Fluvio-glacial outwash (<i>Schotterfeld</i>) | 3. Drumlins |
| 2. Terminal moraines | 4. Central basin (<i>Zungenbecken</i>) |

This diagram shows very broadly the main features of the plateau that are the result of glaciation. It indicates the area abandoned by an Alpine ice lobe.

It will then be evident that the whole foreland division falls physiographically into several distinct sections—the Tertiary Hill Country east of the Lech (Lower Bavarian Uplands); the fluvio-glacial plain of the Inn and the Munich Plain; the Iller-Lech Gravel (*Deckenschotter*) Plateau; the Morainic Country of the east Alpine glaciers; and the glaciated molasse country in the Lake Constance region, described as the Upper Swabian-Bavarian Morainic Uplands; and, finally, the plains along the Danube floor known as the Donauried, Donaumoos, and Dungau (Fig. 13, pp. 82, 83).

GENERAL: SETTLEMENT

The climate varies considerably. Around Lake Constance temperatures are milder than elsewhere. The first frost occurs about the last days of September and the last frost in the middle of April, a total of about 90 to 105 days of frost. On the other hand, around Ingolstadt the frost period covers 140 to 150 days, at Regensburg 105 to 120, and on the Alpine border 135 to 150 days. The range of temperature at Munich is about 20° C. and this is true over the whole of the plateau, while the rainfall averages 60 to 80 cm. in the lower altitudes of the northern sector, and rises to 140 cm. southwards to the foot of the Alps. Munich has a total precipitation of 93 cm. per year. The period of snow cover in Upper

Bavaria lasts 50 to 80 days. The Danube lowland is warmest in summer, but suffers from fog and frost. The southern parts are higher and, consequently, cooler, and get a heavier rainfall also as the mountains are approached. Forest and meadow become more and more frequent towards the south in place of arable that dominates in the northern districts, where there is evidence that on loessic soils much of the land was originally free of forest. The density of population also decreases fairly regularly southwards from the Danube to the Alps, if the urban settlements be excluded, although the exits of the Alpine valleys, especially where lakes occur, are local nodal points where towns and a denser rural settlement are to be found.

Historic routeways traverse the foreland, from west to east and latterly from south to north across the Alps. The north-south valleys hinder east-west movement. The Danube lowland has bogs and valley constrictions and not till Regensburg is reached does a main railway (Paris-Vienna-Constantinople) follow its banks. At Regensburg, too, river navigation acquires some importance. The upper Danube, however, is little used as a river or as a land routeway, and its main importance arises from the bridge points across it. Bavaria has relatively few towns, but numerous market towns, that are spaced at intervals of ten to twelve kilometres, and are commonly sited at river crossings. This circumstance is due to the fact that this area of Bavaria was a single political entity during the Middle Ages when these settlements came into being, and the walled town was not needed, since the small unwalled market towns served the purpose of catering for the needs of the countryside and internal defence of each settlement was unnecessary. The majority of these settlements are planned on a route axis with the wide market place extending on this route, frequently from one end of the settlement to the other. The street market is a planned form. Braunau, the birthplace of Hitler, is an excellent example of such a settlement.

THE SWABIAN-LOWER BAVARIAN TERRACE LANDS (Fig. 97, p. 572)

The *Tertiary Hill Country* or *Lower Bavarian Upland* rises gradually southwards from the Danube from an altitude of 450 to 550 metres and then falls gradually near Munich to 500 to 520 metres, and these levels are concordant with the terraces of the adjacent Alb and Bavarian Forest. Sands and gravels form drier and higher platform levels, but stream erosion has cut these back to form a diversified low, hilly relief with broad meadow-filled valleys. Where slopes are steeper, landslips in the *Flinz* are not infrequent. Such steep slopes occur on the east side of the valleys that are markedly assymetric, a fact that is probably due to the general easterly down-slope of the plateau. (It will be recalled that a very

similar feature occurs in the Lannemezan plateau on the north of the Pyrenees in southern France.) The wide, flat, and often wet, valley floors are barriers and places lie on their edges at bridge points—such as Landau and Landshut.

Isolated farmsteads occur over the whole of this hilly countryside though hamlets are more frequent to the west and market places take the place of towns. Half of the area is under arable cultivation. Niederbayern has excellent wheat country and a quarter is in meadow, that is used particularly for horse raising. A quarter is in forest. A prosperous peasantry, living in large holdings, that are handed from father to eldest son, results in a relatively low density of population of 60 to 70 persons to the square kilometre. Farmsteads are grouped around an enclosed yard and are usually surrounded by trees. The churches alone are centres of rural settlement concentration.

The *Dungau* is the granary of Bavaria, a traditional seat of wheat and barley production. This is the plain along the Danube floor that lies below Regensburg. Its fertility lies in soils of the low, loess-covered, terraces, on which there are compact villages, often only one kilometre apart, that bear such early place name suffixes as *ing*, *heim* and *hofen*. This was indeed the main nucleus of settlement of the early tribal group of the Bajuvars. Urban settlements lie at points where the terraces impinge on the Danube, as at Straubing (23,000), the seat of the grain trade, and Plattling, the railway centre.

Regensburg and Passau are the chief towns of this area, situated at either end of the *Dungau* at strategic crossings of the Danube.

Regensburg (90/108) is the bridge point that links Oberpfalz and Bayern, as well as commanding the road from the Rhine through Franconia to Austria. Here, too, begins modern navigation (though the uppermost head of navigation in the Middle Ages was at Ulm), and it will eventually be reached by the projected canal through the Altmühl trough. Established as a Roman *castrum* on gently rising ground on the north bank of the river, this settlement became a great seat of a Christian bishopric and the royal seat of the last Carolingians, and a seat for the eastward spread of German settlement and religion. It had from early days, therefore, a royal quarter, and an adjacent clerical quarter around the cathedral, both of which lay inside the rectangular wall of the *castrum*. Outside the *castrum* grew the merchants' quarter, around the first market place, the nucleus of the embryonic urban community. Its hey-day came from the trade with the Orient during the wars of the Crusades, but for trade across the Alpine passes with the Italian trading republics in the thirteenth century and after it lay too far east in relation to the great north-south highways and in consequence it declined. This decline was also due, of course, to the closing of the through trade route down the Danube

by the expansion of the Turks in the Balkans during the latter half of the fifteenth century. It later became the capital of Oberpfalz and has always served as the local capital for the rich, closely settled agricultural district to the south, even though it has lost its earlier cultural and commercial significance.

Passau (24/34) is a much smaller town, but one with a similar historic development and regional significance. It lies downstream in the angle of the confluence of the Inn with the Danube and it also lies on the Austrian frontier. It also was an early Christian bishopric established on the site of a Roman camp and it profited too from the trade along the Danube in the early Middle Ages. It also commanded the so-called salt road that crossed the Danube here on its way northwards from the Alps near Salzburg to Bohemia. Its small productive area, however, lay south of the river. But this north-south route later shifted to Linz and in 1803 Passau became a frontier town.

Above Regensburg, the Danube cuts through a constriction, above which lies the *Donau Moos* on raised terraces and on the alluvium deposited alongside the river. This land is fertile and was settled very early, but the southwest section is still a bog. The whole is an area of geological subsidence, and the water table lies near to the surface and it is fed by springs on its borders, so that the ground water can find no outlet. Since about 1800 drainage has gone on and new colonies have been established, such as Ludwigsmoos, but such reclamation has only been successful in recent decades. Rye and potatoes are the chief crops in its fields and straight roads of recent date cut across the plain. Ingolstadt (26,000) is a bridge town, a fortress, an old university centre, and a seat of industry. It has superseded its neighbour, Neuburg (7,500), because the crossing at Ingolstadt had the advantage when Munich displaced Augsburg in the life of Bavaria, for by this route the marsh land (that lies immediately south of Neuburg) could be avoided. Donauworth (5,000) is the next bridge point and beyond it lies the *Donauried*. This area is also a zone of subsidence covered with reed-covered bog. Damp alder woods line the Danube, while adjacent to the *Ried* are low, dry, loess terraces. The last are seats of early settlement (with place name suffixes such as *ing*, *heim*, *hofen*, *steden* and *hausen*). It is extremely fertile, and forms open hedgeless country with compact villages. Small towns line the edge of these fertile terraces, especially where they impinge on the river. In earlier days they enjoyed a livelier activity by participating in the traffic on the Danube. (Type area, Fig. 119.)

The Iller-Lech Plateau (Platte). East of the Lech, the glacial gravels (*Deckenschotter*) are deeply sunken and buried by later glacial deposits. West of the Lech the whole series of glacial and interglacial deposits is evident and each interglacial period is reflected in a new deepening of the

valleys, so that four gravel plains (*Schotterfelde*) rise in steps above each other, and the Tertiary beds are often exposed on the lower valley slopes. Similar features occur along the valleys of the Inn and the lower Salzach. The glacial gravels of the Munich plain have been very little uplifted and lie therefore at a low level as compared with these areas where they form the highest of the terrace levels. All these gravel deposits, however, were formed by glacial rivers flowing northwards and all reach southwards to the edge of the moraines. They attained their greatest deployment between the morainic areas, and the gravels appear in three separate areas, viz. the Iller-Lech plateau, the Munich plain, and the Inn terraces.

The Iller-Lech plateau is bounded by the Danube (*Donauried*), the Iller and the Lech, and by the morainic country to the south. It averages 800 to 900 metres in height at its southern border, falling to 500 metres at its northern border. The whole plateau is cut by many valleys that are drained from south to north, which divide it into a series of interfluvial strips. These valleys were broadened and the river courses shifted and some channels abandoned during alternating periods of erosion and accumulation. The formation of valleys and terraces is thus complicated but at places, such as Memmingen and Kaufbeuren, the four surfaces of the four ice phases may be clearly traced. Here the old gravels form the uppermost plateau surfaces, the younger gravels form terraces forty metres below the first, the upper terrace lies about sixty metres lower and forms extensive and well-cultivated arable lands, while the low terrace follows the present river courses. Loess covers the higher terrace, but not the low terrace, which is thus covered with heath and forest and has little cultivated land. The high plateau gravels have much woodland, however, since there is very little loam soil on them. The types of terrain and their uses come out clearly on the map (Figs. 96-7)—broad valley floors, flat plateau strips with extremes of relief under 100 metres; plateau strips with altitudes of 500 to 600 metres that are open arable areas; and marshy plains (*Ried*) and barren gravel plains (*Feld*) on the valley floors.

These relief features offered effective barriers to east to west movements—the woods on the plateau, the steep valley edges, and the wide, flat and often marshy valley floors. It is no wonder that the ethnographic boundary between Swabia and Bavaria and the point at which the westward march of the Hun invaders was checked lie along the river Lech. On the other hand, the terraces offer good north-south routeways, and this is particularly true of the low terrace that lies nearest to the rivers, for it is followed by the modern railway lines. The high terraces, however, were favoured by the older routeways, the marshy floors being avoided, and here, too, today we find closely settled and open arable terrains. Settlements lie on the inner edges of the terraces at spring lines.

The three-field system with irregular compact villages dominate in the northern sector and hamlets in the southern sector. Small holdings are characteristic, there is a superfluous population and a flow of emigration. Market towns, that are often situated on terrace edges at bridge points, are small.

The chief urban centres, Ulm and Augsburg, are both on the margins. *Ulm* (68/60) at a bridge point on the Danube, commands important routeways across the Alb, notably the Geislinger Steige, to the Neckar lands. The main historic routeway from Flanders to Italy followed this direction. This city also lay at the head of navigation on the Danube. Bridge, route and river combined to give it early commercial importance. It had its origins in a Carolingian castle, but its development was dominated by the bishops of the cathedral which is situated in the heart of the town and its Gothic tower completely dominates the profile.

Augsburg (180/160) collects the east-west routeways. Its site is on the east bank of the Lech, and it lies on the route from the Ries through Nördlingen south to the Alpine passes. Augsburg was a Roman settlement and was early selected as the seat of a Christian bishopric and is older than Ulm. Both cities, however, became important as medieval Imperial cities and both declined with the decline of the trans-Alpine trade at the end of the Middle Ages. In the modern era they have fallen under the shadow of Stuttgart and Munich. Augsburg, whose historic importance is revealed in its ancient buildings, has acquired a ring of contiguous industrial suburbs, that use the water-power of the two rivers and manufacture textiles and machinery.

The Inn Terraces and the Munich Plain. The terraces of the Inn and lower Salzach repeat the features of the Lech-Iller plateau on a smaller scale. North of the lower Inn valley the Tertiary hill country dominates, but to the south the Inn and Salzach glaciers pushed their moraines. The terrace terrains have a width of only fifteen to twenty kilometres, and are wider only between the two glacial lobes. The valleys cut down to the underlying Tertiaries and are covered with meadow and marsh, though the streams are now regularized. Settlements cling to the drier edges. The lower terrace contains forests on its gravel soils, and the chief area of settlement lies on the higher terraces and old moraines. Large isolated farmsteads occur here and the larger settlements are confined to the Inn. For over a century, the Salzach and the Inn have formed the Austrian frontier, whereas Bavaria formerly spread east and the ecclesiastical territory of the archbishops of Salzburg embraced the basin of the Salzach.

The *Munich Plain* is fifty-five kilometres wide at the latitude of Munich and stretches north into the Tertiary hill country and south between the moraines of the Isar and Inn to within ten kilometres of the

Alps. It is a flat basin, about fifty kilometres below its hilly surroundings, sloping gradually northwards from heights of 600 to 420 metres. It is crossed by the Isar river and smaller streams, which, at the northern end of the plain, are at water-level so that the land here is marshy. Here are the large bogs of the Dachaumoos and Erlingermoos. South of Munich the streams coming from the morainic hills disappear in the gravels, and the dry plain is suited only for woodland. The plain was probably formed by the confluence of four wide valleys that, between them, through deposition and lateral erosion, destroyed the terrace inter-fluves. Settlement first took place on the drier, heath-covered gravels, whereas oak and alder woods took up most of the land. Clearings in the forest south of Munich are few, except in so far as they have made way for recent villa suburbs of Munich. The chief older towns lie at its northern border, Dachau and the bishop's city of Freising (15,000).

Munich (826/752) grew as an east-west bridge point on the Isar, where raised drier land reaches the river, at the southern end of the bog plain and at the northern edge of the forest-covered gravel plain (Fig. 99). The Roman road crossed the river further to the south and the old north-south roads are less important than those on the Lech. Munich did not appear as a settlement until the early Middle Ages, when it was founded by Henry the Lion, and though long a royal residence for the kings of Bavaria, it only had 40,000 inhabitants at the end of the eighteenth century. The decline of traffic on the Danube and of the traffic to the east on the old Salzburg-Augsburg road, and the adoption of the Inn as the approach to the Brenner, caused the main traffic stream to be diverted to the east. This favoured the growth of Munich much more than its choice as a royal residence. Today, it is the greatest commercial centre in south Germany and, as the capital of the State of Bavaria, it is an outstanding political and cultural capital. The river early afforded power for industry, that could vie with that of Augsburg. Engineering and brewing are leading industries, and it is an outstanding cultural centre with many public buildings. It is also a tourist centre for its own merits as well as the inlet to the Alps in both winter and summer. These functions are clearly reflected in the build of the city.

In the neighbourhood of Munich there were a few small villages, one of which, called *Munichen*, was established by the monks of Tegern See on a terrace between the Isar and the edge of the moor-plain. Henry shifted the old trade route to this river crossing in 1158 and fortified the market place on the terrace edge in the shelter of the hill-top of Petersberg as a toll station and staple place for salt coming from the Berchtesgaden Alps. This nucleus is clearly recognizable in the modern plan. It lies on the terrace edge that slopes eastwards to the flood plain of the Isar. The first settlement grew around the *Alter Hof* or residence and the old

town hall (Altes Rathaus) and church (Peters Kirche). The salt route formed its axis (the present Kaufingstrasse). The terrace edge directed the future growth. The town spread to the west and grew as a V-shaped projection on to the plain to the east. It was walled in the fourteenth century with the castle (Wasserburg) of the dukes on its northern side. This town wall was greatly fortified in the Thirty Years War and then

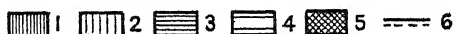
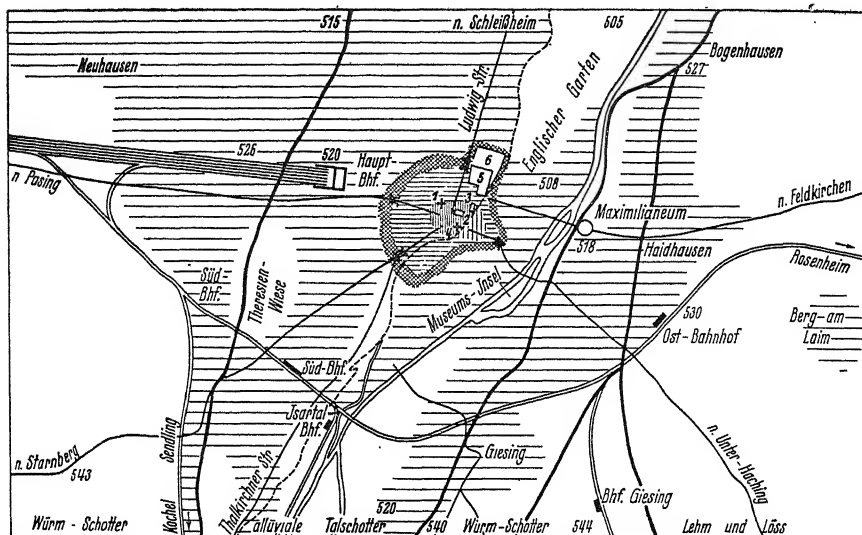


FIG. 99—THE GROWTH OF MUNICH (from Braun) (scale, 1 : 75,000)

- | | |
|---|---|
| 1. Town founded by Henry the Lion in 12th century | 5. Walls in 14th century, strengthened in 17th century, today in open spaces: note four gates |
| 2. Extension in 13th century | 6. Edges of the terraces |
| 3. Town in 13th and 14th centuries | |
| 4. Modern growth | |
| 1. Frauenkirche | 2. Rathaus (Town Hall) |
| 5. Residence | 3. Burg ("Alter Hof") |
| | 4. Peters Kirche |
| | 6. Hofgarten |

lasted into the nineteenth century. The town was of little economic importance and grew very little in the following centuries.

Modern, rapid growth did not commence until it became the capital of the kings of Bavaria in the early nineteenth century. In 1795 the fortifications were removed and replaced by boulevards. Then to the west the Ludwigsvorstadt grew up and to the east the Maxvorstadt. The Isar plain was also drawn into use in the urban plan. The railway to the west with the east-west alignment of the tracks and the station in a sense prolongs the orientation given to the town layout by the east-west high-

way. Extension has taken place mainly to the west and northwest, and along the edge of the terrace to the north and south, with the royal quarters concentrated mainly on the northern side and the river meadows laid out as gardens (English Gardens).

THE UPPER SWABIAN-BAVARIAN MORAINIC UPLANDS

This is a broad east-west belt on the northern border of the Alps with a width of some thirty to forty kilometres. The main physiographic features are shown in Fig. 4. It falls into three sections from east to west as follows: The morainic country of Upper Bavaria, the morainic country between the Iller and Lech valleys, and the morainic country in the Lake Constance area.

Morainic Country of Upper Bavaria. (Fig. 120) Fluvio-glacial terrace lands lie in the Munich plain and the Inn valley. The main morainic country is formed by the young moraines, with hummocky relief, covered with woods, lakes and bogs. Between these two, however, there lies a country of more subdued relief with a more normal drainage pattern, that is good farm land dotted with farms and hamlets. These are the old moraines that were laid down in the earliest (Riss) phase of the Ice Age. This country is overlooked to the south by the higher and more hilly relief of the young (Wurm) moraines, which have been little modified by erosion since the withdrawal of the ice. Ranges and hills in disorder are oriented in curves convex to the north, separated by the low embayments of the Munich plain and the Inn-Alz. Three to four ranges follow each other in this zone and in some areas there are as many as twelve, the outermost being the highest and decreasing in height towards the inside of the amphitheatre. Between the ranges of hills lie channels with lakes, bog and meandering streams, that often cut sharply and deeply through the morainic hills. This country merges southwards into the ground moraine country, in which there are many drumlins and eskers, oval-shaped hills or long narrow ridges respectively, aligned in the direction of ice-flow, with marsh and meadow on the flat tracts between them.

Vegetation cover and land use are varied. Isolated farmsteads are adapted to an economy based on the raising of stock, and farm and commune boundaries frequently lie along the streams and strips of low marshland. Next, southwards, come the great depressions in the centre of the arc-like lobes of the valley glaciers that stretch up to the foot of the mountains whence the glaciers found their exits to the plain. These are plains, still occupied in part by lakes, which were formerly much more extensive after the immediate retreat of the ice. Bogs, too, are extensive on the old lake floors. The areas, however, in spite of these unfavourable terrain conditions, are important foci for the routes that

seek to cross the Alps and even the east-west routes prefer this zone to the hummocky relief of the morainic country to the north. The main glaciers on the plateau were those of the Inn (1,600 sq. km.), the Salzach (1,100 sq. km.) and the Isar (Fig. 98).

The morainic soils are fairly fertile but the high altitude results in a harsh climate. Thus, meadow land is everywhere dominant today, although much of the land is taken up by forest, rough grass, bog and lakes. Spruce and fir forests are dominant but beech woods also occur. The rivers are liable to flood and their floors are marshy, and roads and settlement avoid them. Though the struggle with Nature is a hard one, much has been achieved since the Middle Ages by the farmers, who live in isolated farmsteads that are peppered over the hilly countryside, surrounded by hedged fields of meadow. Nearer the Alpine front, water-power and the felling of timber, as well as the tourist trade, provide added horizons of activity, so that the density of population is here considerably higher than to the north. The few small towns in the Alpine foothills lie at gaps leading into the mountains. They have congested rows of stone-built houses with flattish roofs and long rectangular market places that owe much in their earlier history to trade with Italy and the old salt route to Salzburg. The latter city is one of the most historic cities in Europe. It is an ancient archbishopric, situated at the foot of a prominent hilltop on the banks of the Salzach, and the early seat of the salt trade. It was headquarters for the medieval spread of Bavarian settlement, and became a frontier town in 1805. It was the regional capital of the Salzach basin over which the temporal powers of its bishops extended and the same area has continued to be a political unit. Today it is known above all as a tourist and cultural centre, as well as a minor regional capital.

The Morainic Country between the Iller and Lech Valleys is a belt of about thirty kilometres in width in which ridges of molasse and folded Oligocene and Miocene deposits reach 1,000 metres in altitude. These uplands, however, are plastered with morainic deposits. West of the Iller most of the surface belongs to the molasse deposits of the Alps, and reaches heights of about 1,000 metres and over. These may be referred to as the Allgäu foothills. The moraines of the Lech and Iller valley glaciers reach only twenty-five to thirty kilometres on to the plains, and there is a series of small lobe-basins separated by hills, partly moraines and partly molasse ridges, that reach 700 to 900 metres in altitude. None of these basins carries a lake. The underlying pre-glacial relief affects the present land forms, for there are east-west ridges of Tertiary blocks, that cause irregularities in the disposition of the glacial channels and gorges, where the pre-glacial streams had to cut through them. These interlock with north-south morainic ridges.

Villages dominate in the northern sector west of the Lech. The monks of Kempten encouraged in the fifteen century the consolidation of the scattered strips of the three-field system into consolidated holdings (*Vereinödung*). This movement continued after, especially in the eighteenth century. Many isolated farmsteads were established in this highly fragmented topography, where cultivable land is scattered and pastoral economy most suited to the physical conditions. Thus, the village contains now only a church and several buildings, while the farms are scattered in the countryside. The farm land is almost entirely in meadow, while woods remain on the steep hill slopes and in the narrower valleys. The one-sided pastoral economy leaves female labour free for industry, and textile working is a widespread domestic craft, and industry in factories is pursued also in the towns. (Fig. 120 and Pl. 32.)

The Morainic Country of the Lake Constance Area lies west of the Allgäu foothills (Fig. 96). This area of over 7,000 sq. km. was covered by the maximum extension of the Rhône glacier. Indeed, Riss (the oldest) moraines lie at heights of 700 to 800 metres on the southern slopes of the Alb. The following are the main relief features—an outer zone of older moraines containing two areas of bog; within it, undulating relief, considerable woods, and village and dispersed settlements; then the new terminal moraines of the Würm phase, that carry the main watershed between the Danube and the Rhine streams; and, within this, near Lake Constance, hill and vale relief with isolated hills and flat marshy troughs with many small lakes. Eight embayments mark the site of former ice lobes that branched from the main core of the ice, the *Zungenbecken* (Fig. 98) now occupied by Lake Constance. Between these embayments lie numerous drumlins, trending from west to east, and from northwest to northeast in accordance with the fanwise northward movement of the ice front. A corresponding area within the ice front lies in a semi-circle on the south side of the lake. At the western end, molasse, often capped with glacial gravels, rise as wooded hills to heights of 700 to 800 metres, whereas the drumlin hills reach 480 to 560 metres or 85 to 165 metres above the level of the lake.

Lake Constance has an area of 538 sq. km. and a depth of 252 metres. Alluvial deposition has taken place at the entrance of the Rhine at the upper end of the lake. The Hegau district at the western end of the lake is studded with volcanic hills which were covered by the first Ice Sheet and circumvented by the second. The lake is a climatic oasis, and on its sunny south-facing slopes the vine reaches 500 metres, and everywhere one finds large, prosperous villages, in the midst of orchards. But in the interior of Oberschwaben, away from the lake, it is cold and moist, and woods and bogs are interspersed with meadow fields and isolated farmsteads. The boundary between arable and meadow farming corresponds

closely with the boundary between the old and the new morainic deposits. But even on the young moraines the more fertile soils were formerly devoted to crops such as flax, that supported a medieval linen industry, from which grew later the cotton and embroidery working along the eastern shores of the lake. Consolidation of holdings since the eighteenth century has aided specialization in pastoralism, and grass and orchard economies are characteristic of the people with Alemmanic dialects in the Allgäu as well as in northeastern Switzerland. Co-operative methods have raised milk production to a high standard. To the north and west of the lake, on the other hand, compact, irregular villages are characteristic, that still practise a self-sufficing economy on a strip system. The intensive farming on the lake shores is accompanied by minutely subdivided holdings and the holdings are insufficient to feed their cultivators and their families. Thus, while the density of population in the morainic country reaches 60 to 80 persons per sq. km., on the shores of the lake it reaches 153, in Hegau 109, and in Thurgau 135. On the Swiss side, industry is much more developed, and cotton weaving and embroidery making is carried on in large industrialized villages. Here, too, when climatic conditions and soils are a little more favourable, more arable land, with wheat as a crop, appears. (Pl. 29.)

Thus, Lake Constance is the economic and demographic focus of this southwestern corner of Germany, that has such close amnities with Switzerland on its opposite shores. Five States and three Empires impinge on its shores. The monasteries of St. Gallen (in Switzerland), Reichenau and Constanz are among the earliest seats of medieval settlement in the German lands. Here, too, was the capital of the kings of Swabia in the tenth century at Hohentwiel. Here were concentrated important overland routes, attracted to the river as well as to the lake.

Constance (36/39) was the chief centre, the seat of a Roman castrum and the site of an early Christian bishopric, that became the nucleus of the town before 1200. It emerged as great focus of landways for Swabia and Switzerland and for the route along the Rhine in the later Middle Ages from Strasbourg via Basel to Venice. It was probably because of the attractiveness of this area that in the Middle Ages it was a bone of contention and was coveted by the surrounding territorial Powers. Many towns and political units sought a frontage on the lake. The decrease in importance of the Splügen pass, that lay due south from Lake Constance and was approached up the Alpine Rhine, and the difficulties of navigation of the Rhine, caused the relative decline of Constance and prevented it from becoming a single dominant urban centre. The railway actually avoided Constance, and it now occupies a very unfavourable site and the lake has become the frontier between Germany and Switzerland. Constance lies at the end of a long peninsula that confines the connection be-

tween Lake Constance and the Unter See to a narrow channel. The historic nucleus, however, spread across this channel to the south shore. The frontier encircles the south of the town which is thus cut off from its natural hinterland in Switzerland. For all these reasons, the town today has only about 40,000 inhabitants.

The lake-shore towns are small seats of viticulture, fishing and tourism. The main north-south railways skirt the eastern and western ends of the lake at Bregenz and Singen (an industrial town and rail junction of modern growth). A branch line from the former runs down the peninsula to Constance. No lines run along the north or south shores. Friedrichshafen, centre of the narrow frontage of Württemberg on the lake, former residence of the royal family of Württemberg, and birthplace of the first Zeppelin, has a rail north to Ulm. Lindau, actually a small island that is an "outlier" of Bavaria, has contact with the main railway through Bregenz to Munich. The lake has little water-borne traffic, while Isny, a medieval town at a focus of medieval highways, is cut off from modern communications. Similarly small are the historic towns that lay on the old highway from Schaffhausen northeast to the Danube. Ravensburg (17,000) formerly was an important centre sharing the trade of the southwest with Ulm.

This whole area had several flourishing small towns in the Middle Ages, which lay on main routeways across the Alps, and were among the nearest places to the towns of north Italy. These towns early developed textile crafts, which they developed further with the advent of cotton-spinning and weaving in the early nineteenth century. But this sector has been little affected by modern change and the small towns retain their historic buildings and general aspect almost intact.

THE BAVARIAN ALPS

We may now turn to consider the three sections of the Bavarian Alps. The general features have been reviewed on pp. 47-9. See Fig. 97, p. 572.

The Allgäu Alps form a deep horseshoe-shaped area which is drained north by the Iller. The wooded uplands that stretch across its northern end between Isny and Kempten, rising above the meadow-covered plateau, are the outermost part of the molasse zone. South of it rise high, steep-sided ridges; these are the highly tilted Nagelfluh beds. North of Immenstadt the hills have heights of under 1,300 metres, but become higher to the south and are mountainous in the Rindalphorn (1,822 metres). South of this zone is the Flysch zone that has a smoother relief, though it reaches even higher altitudes. This is a zone of meadows and summer alps, strewn with numerous summer chalets. In the zone there are also limestone karst blocks such as the Gottesacker plateau (2,230 metres),

the name of which suggests its forsaken, barren character. The southern frontier is a great mass of Trias dolomite thrust over the Flysch. This is high alpine relief, with sharp peaks and high rock-scarred faces. In this zone the headstreams of the Iller follow deep glaciated valleys and moraines accompany the valley downstream to Obersdorf. Stretches of impervious Lias clay deposits form areas of smoother relief that are well watered and green. Much of the area has been heavily pastured and stream erosion, in consequence, has had serious effects, aggravating the regime of the river and causing floods and sedimentation downstream. Molasse, Flysch and Lias beds all give reasonably good soils. The climate, however, is severe. Permanent snow can be found down to 1,500 metres. Grains ripen with difficulty and the whole area is predominantly under grass. Dairy farming is the keynote of the economy. There is a continuous up- and downhill movement to and from high pastures. Settlements lie in three altitudinal zones. At the beginning of June cattle are taken from the *Voralmen* to the *Hochalmen* and return in mid-September. Hamlets and dispersed farmsteads dominate and the highest permanent settlement reaches a height of 1,169 metres. Forested and unsettled in the Carolingian era, its first settlement was effected by monastic orders, particularly from Kempten. Roman settlement did not reach here and its settlement is entirely Alemannic. The name of the area is derived from Alpgau and it has always been associated with the north rather than with Vorarlberg to the west and the Tyrol to the east. But its northern part was skirted by the west-east salt route through Immenstadt to the Lake Constance, from Munich to Lindau. Here, too, the abundant local supplies of running water were used as the basis of textile and woodworking industries, that still continue, and give to this area a relatively high density of 66 persons per sq. km., whereas the more isolated and mountain-enclosed sector to the south is devoted to cattle raising, milk production, and the tourist trade. Oberstdorf (4,000) is the chief centre. It is in this area that we are able to trace the process of settlement dispersal through the encouragement of the monasteries in the seventeenth and eighteenth centuries, so as to facilitate the development of the pastoral economy that was particularly suited to these relief and climatic conditions.

The Bavarian Alps east of the Lech. A narrow sandstone (Flysch) zone on the northern border of the Alps reaches maximum heights of 1,600 metres. Here the valleys are wide, meadow-covered and well settled. Here is the Tegern See. South of this are the limestone prealps, though soft dolomitic limestones are intermixed with impervious and softer beds. The zone is cut by many valleys and nowhere reaches 2,000 metres. The wooded dolomitic hills, with deep valleys covered with conifers, are thinly settled, but the zone is crossed by relatively easy

routes via the many watersheds. The valleys follow both longitudinal and transverse sections. On the northern rim occur resistant limestones that form high ridges rising steeply from the Bavarian Plateau. These are famous outlook points both to the north and over the lower dolomitic country to the south. The Isar valley and Garmisch border this zone to the south.

Eastwards the frontier swings southwards around Garmisch and Mittenwäld in the Loisach and Isar valleys to include in the south a part of the high central limestone alps (*Kalkhochalpen*). These are the Wetterstein and Karwendel mountains. Here on the southern border is the Zugspitz (2,967 metres). This mountain range strikes the Isar valley at Mittenwald, above which is the famous Porta Claudia or the gate of Scharnitz. The ridges here on both sides of the river are arranged *en échelon*. Jagged peaks and extensive screes and rubble-filled valleys and cirque hollows characterize the most southerly ranges of Bavaria, which are either covered with forest or have bare rock or screes on their surface.

The whole of this predominantly mountainous and dry mountain country is almost useless for settlement. Only 4 per cent of the area is under cultivation. Grassland accounts for a fifth of this as opposed to two-thirds in the Allgäu. Forest covers 60 to 80 per cent of the area. Shepherds (*Senne*) in the Allgäu are here replaced by wood-cutters and hunters, and woodworking is the only indigenous occupation. Settlement ceases at altitudes of 900 metres and summer pastures are little used. On the other hand, a few valleys that are served by the warm fohn wind provide local oases of cultivation. Such are the valley at Mittenwald and the basin at Garmisch. Yet, the whole area is easily crossed—unlike the Allgäu. Garmisch and Mittenwald both originated primarily through their command of the roads across the mountains via the Fern and Seefelder passes, although they owe their present importance to the great development of the tourist industry. A little below Mittenwald the Isar water is used for the power plant of Walchenseewerk that serves all Bavaria.

Berchtesgaden Land. Eastwards the limestone high Alps broaden out and fork into six ridges that encircle the basin of Berchtesgaden that forms a distinct physical and human entity. Limestone blocks rise above smoother relief developed on impervious rocks where springs come to the surface. Thus arise the contrasts of great rock slopes, scars and cirques above, green-covered hills with streaming water below. In the heart of this area lie the two lakes of Königsee and Obersee, separated from each other by rock debris, with Berchtesgaden at the northern end. South of the lake, at altitudes over 1,700 metres, lies the Steinerner Meer. At a height of 2,500 metres lies a barren karst wilderness with variations of 600 metres in its degree of relief, high above the tree line. This area served

as a reservoir of ice in the Ice Age and fed the deep valley glaciers around it, whose evidences are left in the great deepened valleys. In the midst of this mountainous frame lies the town of Berchtesgaden surrounded by a circle of dispersed farmsteads located on the morainic deposits around it. Settlements on the sunnier slopes reach 1,100 metres, but are entirely absent in the surrounding mountains. This small area constituted a separate State ruled by its Provosts until 1803. Cultivation was always insignificant. There was a little wood carving. Salt working in the Salzach valley in pre-Roman times was known in this region in the twelfth century. But there was a shortage of timber to treat the salt and in 1817 *Solenleitung* commenced, that supplies the salt workings at Reichenhall. It was the wealth of this small State in salt that prompted its annexation by Bavaria. This salt-producing area, the Salzgau, has its focus in Reichenhall, a great summer holiday resort (8,000). Berchtesgaden (4,000) is also a modern seat of the tourist industry.

CHAPTER 24

THE NORDMARK

SCHLESWIG-HOLSTEIN AND LÜBECK (Sheet 2, Fig. 85, p. 519)

THIS AREA lies astride the North and Baltic Seas at the head of the Jutland peninsula. The isthmus, some seventy-five kilometres wide, has always been of great importance as a link between the two seas, since it offers a route that avoids the long sea passage through the Sund and the Great Belt. It also lies on the northern border of the lands of the German-speaking peoples, the post-1919 frontier being placed just to the north of Flensburg. There is evidence of very early trade across the head of the peninsula. Schleswig and Flensburg, each reaching town status in the late twelfth century, had easy land crossings to the Elbe estuary, thence across the estuary to Bardowick, and later to the town of Hamburg that displaced the latter, and thence overland to Lüneburg and to central Germany and beyond. Kiel, however, grew slowly in the Middle Ages and did not join the Hanseatic League until 1363. Lübeck was the medieval mistress of the Hanseatic League and had active trade connections with the river ports of the German Lowland and Flanders, whereas, with the shift of the channels of trade, Hamburg became the mistress of Germany's overseas commerce in the nineteenth century. These ports lie on either side of the isthmus. The old connections between them by road and canal were shifted northwards in the later nineteenth century by the opening of the Kaiser Wilhelm canal from the head of a deep-water sunken estuary (*Förde*), where Kiel developed as a great naval base on its sheltered eastern Baltic side. Location and space relations are thus primary factors in the appreciation of the geography of this province.

The two political provinces of Schleswig and Holstein have existed for a thousand years. They are permanent politico-geographical entities although they have had varied relations with each other and with Denmark to the north and with the German lands to the south. To the south, the isthmus is commanded by the independent Free Cities of Hamburg and Lübeck that vied with each other for possession of the rags and tatters of land between them that were embedded in the dukedom of Lauenburg between Holstein and Mecklenburg (Fig. 55, pp. 330, 331).

Schleswig-Holstein is a border province. Holstein lay south of Kiel and Schleswig north of it in 1789, with the Eider river as the traditional boundary since the early Middle Ages between the German Reich and

Denmark. Schleswig was a border province and was never closely affiliated with the Empire. In 1864 both provinces were forcibly annexed by Prussia, while the Free Cities of Hamburg and Lübeck lay at either end of the peninsula and various independent tatters of territory in between. In the 1930's these latter together with Lübeck were merged with Schleswig, and other territories passed to Mecklenburg, while Hamburg retained its independent status.

On the border zone of Danes and Germans the Danish kings erected fortifications—the Dannewerk—from the ninth to the thirteenth centuries, and nearby are the ruins of Haitabu, a famous Viking trading settlement. It was not until 1027 that the Eider became the Reich frontier, and in 1460 Holstein and Schleswig were merged into one dukedom under the sceptre of the Danish king. East of a line from Kiel-Segeberg-Sachsenwald lies German colonial territory, that was originally occupied by the Wends. In 1139 Wagrien was conquered and in 1143 Lübeck was founded and at the peak of its power was mistress of the Baltic Sea, after defeating Denmark in 1370. The Thirty Years War ended the greatness of the League and of Lübeck.

The province is part of the North German Lowland. It is blanketed with glacial and post-glacial deposits of great depth and only in a few isolated places does the underlying chalk stratum come to the surface in western Holstein, where it forms the basis of a cement industry. The land of Schleswig-Holstein has been compared to a pancake that tastes best on its edges, or with a pig that has a thin back and two fat sides. The more productive periphery is found on the marshes to the west and the hilly country to the east, while the poor interior is the Geest. These are the basic landscape contrasts.

The Western Marshes. The *Marsch* is the product of centuries of struggle between man and the sea. The shallow foreshore has been diked in stages in shallow estuaries that penetrate well into the interior between ten low peninsulas. The chief peninsula is Eiderstedt (north of the Eider estuary), but even it has been formed from three separate peninsulas that existed in the thirteenth century. The coast of north Friesland, on the other hand, from Husum to beyond the frontier, is relatively smooth, with outlying small reclaimed islands. At low tide salt mud-flats, known as *Watten*, lie above the water and connect the north Frisian islands with the mainland. Much reclamation has been affected on the whole front since the seventeenth century. Most recently in north Friesland, between 1921–5, 2,000 hectares were diked to form a *Koog*. Works between the wars included diking and the encouragement of silting. Great dams were built to link Sylt with the mainland. The Hindenburg dam, built in 1927, measures 11 km. and has a width of 11 metres. In 1933 a big scheme was started above Friedrichstadt (a Dutch

foundation of 1621) to drain and reclaim 35,000 hectares. Great stretches of land can be reclaimed as far seawards as a line south from Sylt, the western end of Eidenstadt, to Trischen, the island out from the Elbe estuary.

The climate in this westward-facing country is oceanic. It has cool summers, with strong and frequent west winds, skies are often overcast, and rains are heavy, especially in October. This farm land has the highest wheat yields in north Germany. Trees, orchards and gardens do not flourish and are relegated to the east of the peninsula. But temperatures are mild, so that cattle may be kept in the meadows from early May to the end of October. "Wasser, Wiese, Weide, Weizen" are the four W's of the Marsch peasant. The economy is thus predominantly a pastoral one. The land is almost entirely under grass for cattle—90 per cent in the district of Eiderstedt. Some sheep and geese afford subsidiary sources of income in the outer diked land, cattle on the *Koog*. There is also a considerable amount of horse-raising. Summer wheat, beans and cabbage are the arable crops.

The ethnic contrasts between the Frisians north of the Eider river and the Saxons of Dithmarsch south of it are scarcely apparent in folk culture, but appear markedly in house structures and rural settlement. Most of the oldest settlements are on what were originally raised mounds. In north Friesland these settlements contain a few farmsteads, whereas in the Dithmarsch the settlements are normally large villages. The Frisian farmstead appears on the northern marshes, whereas the Dithmarsch farmstead is closely allied to the Saxon house type. But all the people are traditionally preoccupied with the struggle against the sea, and are independent in character and suspicious of outside contact and influence. Until 1559 the small peasant republic of Dithmarsch withstood the attacks of kings and counts. It has also produced notable poets.

The Central Geest. The central upland includes, in its north-south arrangement, the old Geest in the west and the young Gees in the east, for the front of the ice lay from north to south and retreated eastwards. The old Geest land in the west is not an unbroken belt of raised land, for it is crossed by wide flat floors. These are westerly continuations of the sandy plains, which are occupied today by small streams between the Eider and the Treene, so that the raised land stands out as strips and "islands". The sandy plains merge into the coastal marsh, but the raised Geest drops abruptly, often by scarps, the highest being over ninety metres high. Erosion has smoothed and regularized the surface features, lakes have been filled in, stream courses smoothed out, and the surface leached of lime to a depth of twenty metres. From Lauenburg to Wiedau there is an uninterrupted series of villages and small towns.

The more recent Geest to the east, laid down as fluvio-glacial deposits

of the last glacial phase, contains flat alluvial fans at the exits of glacial channels through the moraines. It has a hummocky relief developed on sand and gravels and wind-blown dunes, while there are considerable areas of bog, especially on the western margin.

Its poverty-stricken soils contain occasional fields of rye, oats, potatoes and buckwheat, that alternate with occasional clumps of stunted oak wood (*Kratt*), peat, bog and coniferous woods. In the north there are meadows and pastures. In the Middle Ages, there were probably more extensive stands of oak wood, and it is only through the cutting of the trees for export and wasteful usage that heath and *Kratt* have taken the place of this initial woodland. In more recent times, heathland has been afforested and peat bogs drained. This was, however, the earliest land to be settled by prehistoric man, who selected sites on its raised patches in the Bronze and Iron Ages.

The Eastern Morainic Uplands. The morainic country to the east begins at the line of the railway from Flensburg to Neumünster, thence encircling the Lübeck bay. Here it was that the Ice Sheet made its last stand, leaving behind it a belt of complicated terminal moraines. In eastern Holstein terminal and ground moraines are intermixed and there results a varied relief of hummocky hills and flats, hills and hollows. This district, that is called the Holstein Switzerland, presents a rapid alternation of lake and forest, in which the highest points reach 150 to 170 metres. Beech woods cover the hills, and meadow, bog and lakes (many of them morainic dammed lakes), fill the depressions. Towns are often sited on narrow strips of land that separate one lake from another, such as Eutin and Plön.

These features are found in less severe form throughout the eastern hill country in which hummocky and smooth relief are intermixed. Drumlin and esker are frequent and the smooth surface of the ground moraine country appears only in the islands of Fehmarn and in the peninsula of Wagrien. It is in these areas that the best soils are found, and here, too, prevails the smallest rainfall of under 600 mm. per year. These latter areas have black, loessic soils, while the soils in the rest of the morainic country are brown or brick-red forest soils. Sub-glacial melt-waters eroded channels in the ground moraine and these were later submerged by the sea to form the long, deep embayments (*Förde*), such as the Flensburg and Kiel bays. The submergence was deepest in the north and here the embayments, such as that of Flensburg, penetrate deep inland, right to the hills of the terminal moraine, whereas further south, where the ground moraine country is wider, the embayments do not penetrate so deeply inland, and there are several independent valleys, such as that of the Trave.

Old district names reflect the early settlement of these eastern districts.

Such are Angeln between Flensburg and Schlei bays; Schwansen between Schlei and Eckernförder bays; and the Danish Wahld between Kieler and Eckernförde bay; Probstei south of Kiel bay; and the peninsula of Wagrien east of the Kiel bay. There is a regional distinction here in the distribution of German and Danish cultural influences, for south of the Eider there are no Danish names, and south of the Schlei no Danish house forms. The landscape of Angeln has a mixture of Saxon and Danish house forms, whereas north of Flensburg bay Danish folk dominate and here, too, occurs the Jutish rectangular enclosed farmstead (*Vierkanterhof*). Throughout the whole area, compact villages are unimportant as compared with dispersed farmsteads and small hamlets. The era of forest clearance did not actively set in until the twelfth and thirteenth centuries. Large holdings in the Schwansen and Danish Wahld are compact with hedges (*Knicks*) around the fields where cattle and horses are raised and fattened on the meadows (Pl. 18). Grains and oil seeds are also grown in a long rotation. Smaller holdings, with a land-owning peasantry, have increased during the nineteenth century, so that three-quarters in Angeln, one-half in Schwansen, and one-third in Danish Wahld of the former estates (*Hofland*) are again in peasant hands.

Rural Settlements. On the North Sea coast and on the banks of the Elbe, the "marsh" village (*Marschhufenorf*) is dominant, while in the Geest, compact villages dominate. In the eastern Baltic-facing country, a mixture of villages, hamlets and isolated farms dominates in the north, and villages, hamlets and large estates and fewer isolated farms in the south. In the western marsh zone the Frisian built his single farmstead on an artificial raised hill; whole villages were similarly sited on such mounds or *Wurten* (note the suffix *wörde* and *wärden*). But systematic settlement dates from the twelfth century and this began with the construction of dikes as a protection against high tides with sluices to drain the land at low tide. Later another dike was built further out when the mud had again accumulated on the new foreshore, so that several dikes often lie parallel to the coast and others at right angles to them, so as to minimize the danger of floods in case of a sea-break through the dikes. Today we find village settlements strung along the top of the inner dikes —on the seaward dike only are found farms on the inner sheltered side of it. The outermost dike, that protects the grazings, usually has no settlement at all. Sometimes the whole floor of the Marsch is covered with settlement, not along the dikes, but irregularly scattered over the land, and here, in general, almost all the land is devoted to grass, as in the district of Eiderstedt.

The Geest zone has farms that are a third of the value per acre of the Marsch soils. This is poor heathland, but it was the earliest to be settled, beginning on the raised heath and spreading in historic times to the flat

meadowland. In these areas, too, is to be found the old Saxon nucleated village. Laws permitting consolidation of holdings date from 1766 to 1770 and a good number of isolated farmsteads have been established since this time. The patches of bog have *Fehnkolonien*, with farms strung along drainage canals, as in northwest Germany.

In the eastern morainic country the deposits of melt-waters are well drained and carried light forest and were more easily cultivated, and from here the more thickly wooded areas and the bogs were settled. In the country of Angeln there are old villages and a thick net of isolated farmsteads and small hamlets—the farms usually lying near to the roads. Similar settlement conditions are found in Denmark, where the initial compact village with the three-field system has all but disappeared as in England. Moreover, settlement by small squatters (*Kötner*) took place in the surrounding Mark around each village. In Schleswig this change came later—the medieval villages were established as compact communities—and in Holstein, that was continuously a part of the Reich, this change does not appear.

Southeast of the Kiel bay the young moraine country shows some new features for the bays and lakes and the hills give to it a very varied landscape, that reaches its extreme form in the Holstein Switzerland. The land of Wagrien, east of Kiel, early became a part of the Reich and its settlement history ran much the same course as that of Mecklenburg. Slavs spread into this area and to them is to be attributed the predominance of small villages and large estates (*Gutshöfe*). In eastern Holstein, unlike Mecklenburg, German colonization took place in the twelfth century. The island of Fehmarn has some peculiar features for, like Dithmarsch and Eiderstedt, the compact village, established by the Frisians, is dominant, whereas in Danish Wahld the large estate dominates, although it was not a Slav land. These large estates are also frequent in Schwansen and east Angeln and in these respects they are transitional between the northeast of Schleswig, which is Danish, and the former Slav land of Wagrien.

Urban settlements fall into two series. A western series follows the course of the edge of the terminal morainic hills and the eastern at the head of the *Förde*. Flensburg (68,000) combines the two types, for it lies at the head of the bay and is encircled by the hills of the terminal moraine. A hundred years ago this town was more important than Kiel, but today the frontier cuts across its natural hinterland and its importance has declined. Kiel, situated at the head of the bay of that name, has its nucleus in a small oval-shaped medieval town, but its modern growth has been very rapid, since 1871, when it was established as a naval base and shipbuilding centre at the eastern end of the Kaiser Wilhelm canal with deep water. Shipbuilding yards and industrial plants line the gently

sloping land at the head of the bay. But it has passed through difficult days since 1919 and suffered badly from bombing. Schleswig (18,000), the oldest town of the Nordmark, is the seat of the provincial government and Rendsburg (17,000) is a fortress on the Kiel canal, with textile, leather and shipbuilding industries. Neumünster is an important regional centre (51/66).

Schleswig (23/37) is the oldest town in the Nordmark. It is situated at the head of the *Förde* into which flows the Schlei. A church was founded here early in the ninth century on the site of a Slav settlement. The Schlei is 40 km. long and has a width that ranges from 5 km. to 200 metres at its head. The depth averages 4 to 5 metres, though it often reaches 10 to 15 metres. An island bars the entrance and the southern entrance was blocked with sunken ships and then by stone walls, so that the northern channel was improved. Schleswig lies at the head of the bay on its southern side. It probably had several nuclei that were protected on the landward side by *Noore* or abandoned meadow-covered tributary channels of the bay and streams. In the tenth to twelfth centuries Schleswig was an important port and a chief break of bulk place for the traffic across Schleswig-Holstein along the Eider-Treene marsh-filled depression. The heights between this depression and Schleswig were protected by the fortifications erected by the Danes to the north. Its importance, however, decreased in the thirteenth to fourteenth centuries with the growth of Lübeck and with the use of larger vessels. The destruction of the town by a Danish attack hastened this decline. It has since remained an administrative centre, although even in this respect it has suffered through the competition of Kiel.

Flensburg (68/101) was established about 1150 and received town law in 1284. It has grown in the nineteenth century as a liner-port and industrial centre and today has 100,000 people. It lies at the head of a *Förde* with a depth reaching thirty metres at its mouth and five metres at its head. From the head of the bay a valley and a flat depression lead across the peninsula. The surrounding land is rich agricultural land with market gardening and orchards and livestock-farming. It was also favoured by Denmark in the past, and in the early nineteenth century it was one of the chief Baltic ports and had direct liner connections with west Europe and the West Indies. It also takes part in the whaling industry. In 1800 it had 10,000 people. The competition of other ports brought about its decline in the mid-nineteenth century, but when annexed by Germany it was able to redevelop its shipping connections and to attract industry, especially shipbuilding. After 1900 it was the chief seat of shipping firms among the German Baltic ports. Its shipping tonnage a hundred years ago was 30,000 registered tons, but in 1870 it had fallen to 7,000 but rose again to 77,000 in 1910 when it occupied

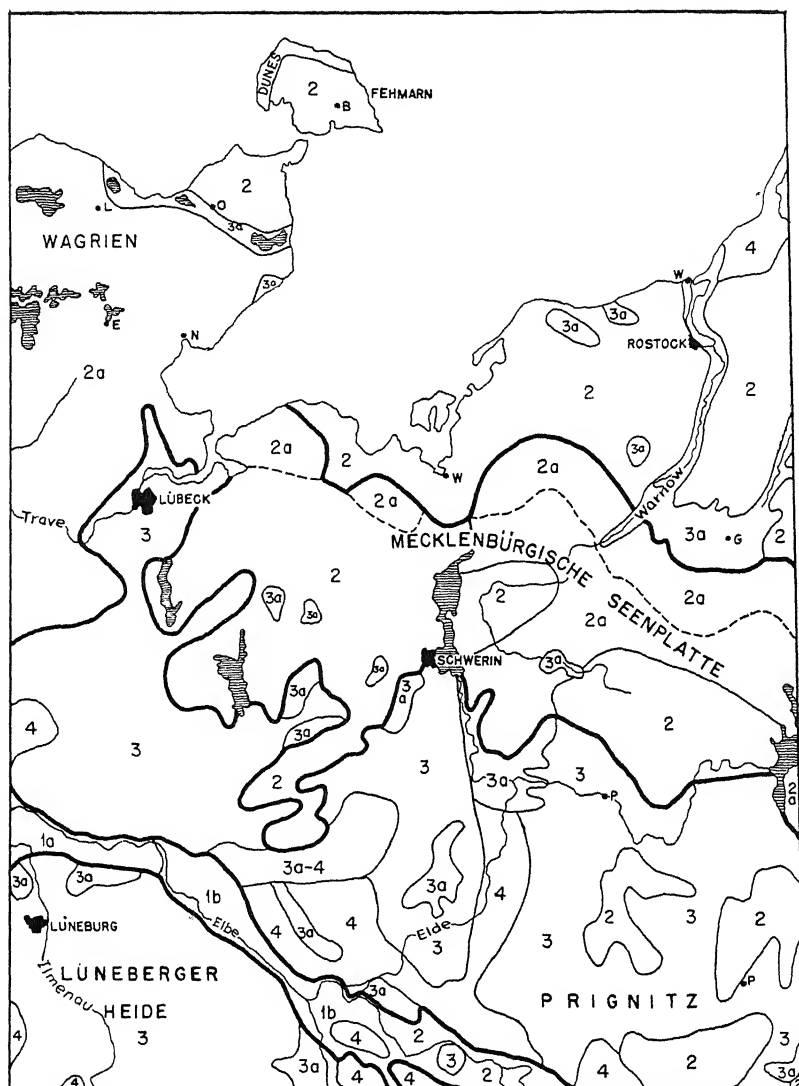
third place in the Reich after Hamburg and Bremen. Shipping connections were rapidly re-established after 1919 but the trade of the port in timber, coal and coke was hit hard in the inter-war years and industries and shipbuilding have suffered and shipping lines have shifted to Hamburg or Bremen. It also was severed from its northern hinterland by the southward shift of the Danish frontier.

Kiel (261/214) lies at the head of the best of the *Förde*, that penetrates with a funnel shape 16 km. inland. It is 7 km. wide and 15 to 27 km. deep at its mouth, and has a depth of 6 metres at the head where Kiel is situated. A small dry valley, called the *Kleine Kiel*, lies on the north-west side of the head of the bay and a flat depression leads to the valley of the *Eider*, and a stream, the *Schwentine*, enters the head of the bay and was formerly navigable to *Plön*. Kiel was founded by the *Schauenburgs* as a rival of *Lübeck* and received town law in 1242 and became a member of *Hansas* in 1363. It occupied a site protected by the natural defences of the *Kleine Kiel* and the bay. But it could not compete with *Lübeck*. The *Eider* canal to the North Sea, built in 1777-87, gave some stimulus to growth but in 1810 it had only 7,000 inhabitants. Its modern development began with the *Schleswig-Holstein* wars, the growth of its university, that was founded in 1665, and the advent of the railway in the 'forties. But the chief fillip was its selection as a naval base by Prussia following the annexation of *Schleswig-Holstein* in the 'sixties, as *Wilhelmshafen* had been selected on the North Sea. Thousands of soldiers, naval troops, officials, dock-workers flocked to the city and by 1914 there were 20,000 workers in the three great shipbuilding yards. Baltic shipping companies were also established and the tonnage of the ships using the port reached 30,000 registered tons in 1890. It also took part in the *Scandinavian* trade. Its shipping tonnage in and out reached one million registered tons in 1913. Its population grew from 7,000 in 1871 to 30,000 and reached 210,000 in 1910. The *Kiel* canal did not play a large role in the latter period of this development, for it was meant primarily for the speedy movement of the fleet. This canal was built in 1887-95, 100 km. long and 9 metres deep, from *Holtenau* to the upper *Eider*, and passed *Rendsburg* thence to *Brunsbüttel* on the *Elbe*. It was improved before 1913 to a depth of 11 metres with new locks 330 metres long (double the first), 45 metres wide and 13.5 metres deep. Its traffic in 1913 was 10.3 million tons, in 1930 22 million, and in 1932 13 million net registered tons. But this traffic by-passes Kiel and has in fact brought more advantage to Hamburg. This was evident in the decrease of the shipping tonnage of Kiel and a decline in the importance of its timber trade. Port equipment has been erected (*Nordhafen*) at the entrance to the canal, and it seems probable that the two places will certainly merge as one functional complex. Meantime, Kiel suffered heavily

after 1919 by the decline of the fleet and of shipbuilding, and the shift of the trans-Baltic services to Warnemünde. Total shipping traffic fell to 700,000 net registered tons and in 1939 the population was 261,000 as compared with 245,000 in 1919 (1946, 214,000).

Lübeck (149/236), situated on an island at the mouth of the small river Trave, was the chief city and port of this area in the Middle Ages and after. Founded in the twelfth century by Henry the Lion, it drew something of its initial stimulus from the destruction of Schleswig in 1157 by Henry the Lion. Their merchants shifted to the new settlement of Lübeck, which was founded by Henry in the same year. It became the mistress of the Hanseatic League and reached the zenith of its power in 1500 when it had about 50,000 inhabitants. The Stecknitz canal was built across the low watershed at the end of the fourteenth century (1391-8) across the peninsula to carry salt for salting fish. A second canal was built shortly after 1500 to serve for the transport of general merchandise, but this was a joint undertaking by Lübeck and Hamburg, and soon fell into disuse, owing to difficulties of water supply and to the opposition of landlords through whose territory it passed. Control of this important corridor between these two cities was jealously sought after by the burghers of both cities and by the territorial lords between the cities and there emerged a crazy quilt of small territories which have only recently (in the 'thirties) been eliminated by their absorption into Mecklenburg. The decline of Lübeck, concomitant with that of the Hanseatic League, witnessed the rise of Amsterdam, Antwerp and Hamburg and the growth of its Atlantic overseas trade. In 1800 Lübeck was an insignificant port and had only 22,600 inhabitants. The city has experienced a revival since 1890 with the improvement of the Trave navigation below the city (depth of 9 metres), the opening of new harbour facilities below the town, and the opening of the Elbe-Trave canal in 1900 along the line of the old Stecknitz canal. This canal is 67 km. long and is used by 800-ton barges; it carries about one million tons of goods per year.

The total population of Schleswig-Holstein in 1939 was 1.59 millions and in 1946 this had increased to 2.65 millions. Even the towns, with the exception of Kiel, have increased their numbers, and in many districts there are today more refugee immigrants than natives. The density of population for Schleswig-Holstein as a whole was 101.5 persons per sq. km. in 1939, but most of the area had less than 50 persons to the sq. km. The immigration of large numbers of refugees, in both country and town, has greatly altered these figures, for the population has increased by over 70 per cent between 1939 and 1946. All densities have increased and the rural areas now have almost everywhere between 50 and 75 persons per sq. km. The result is rural overcrowding which even



FIGS. 100 and 101—TERRAINS AND REGIONS: Sheets 3 and 4. MECKLENBURG-VORPOMMERN

Four main types of country run parallel to the coast. From north to south these are:

- (i) Spits and bars and enclosed inlets on the coast
- (ii) Flat or undulating country of ground moraine
- (iii) Hummocky lake-strewn forested terminal moraine hills (Mecklenburg Lake Plateau or *Seenplatte*)
- (iv) Level, forested outwash sands (*Sandr*) to the south. Bog lies in the valleys and around the lakes



- 1a. *Alluvial Plains.* River flood-plains.
 1b. *Low-lying Clay Plains.* Streams and ditches. Closely settled. Mainly meadow land.
 2. *Flat or Undulating Arable Land: Ground Moraine.* Loam soils. Over 70% arable (wheat and sugar beet). Little woodland, Compact villages. Large holdings.

[Continued on page 615]

the subdivision of large holdings cannot absorb. Industry might absorb the extra hands, but here there are small prospects of expansion, and it would seem that about half a million persons cannot be employed in the province and must go elsewhere. The number of dwellings in 1939 was 435,000, but in early 1949 there were only 431,000. In Kiel the dwellings were reduced by bombing from 77,000 to 49,600. For the province there were 2.3 persons per room. There is a need of 300,000 dwellings—half this number, if 600,000 people are removed elsewhere. Numerous social problems arise from this state of overcrowding—an increase of tuberculosis, difficulties of starting new industries through the lack of houses, overcrowding of transport facilities, and long distances over which workers must often travel to their work, and the lack of facilities for the tourist industry which was so important in the livelihood of the province.

MECKLENBURG-VORPOMMERN (Sheets 3, 4, Figs. 100-1)

Northwards from the Thorn-Eberswalde trough sandy plains (*Sandr*) and moraines merge into the lake-strewn plateau (*Seenplatte*) of Mecklenburg and Pomerania, known generally as the Baltic Uplands, that stretch from Schleswig-Holstein to East Prussia. While general surface features are much the same in the whole area of the Baltic lands, the main contrasts lie in the coastlines. The coast west of the Oder is a submerged one, while east of the Oder deposition and uplift is the keynote to its formation. In Schleswig-Holstein the embayments are called *Förden* and in Mecklenburg *Bodden*. The coastline in Pomerania east of the Oder is smooth, since the eastward coastal drift has formed long sand spits or *Nehrungen* with enclosed *Haffs* behind them.

The portions of three physical units, as shown in Figs. 4 and 13, make up this province. They are the morainic lowland in the north (2), the Lake Upland in the centre (2a), and the heathlands of Uckermark and Prignitz to the south (3). These detailed terrain features are shown in Figs. 100-101 on pp. 612-13. A type area is shown on Fig. 109.

Two main terminal moraines form the backbone of Mecklenburg over a belt about thirty kilometres wide that forms the watershed between the Elbe and the Baltic Sea drainage. This is the "lake plateau" or *Seenplatte*, an area of hummocky, moraine relief with many overflow channels and lakes. There are great stretches of sandy plains (*Sandr*) on the south side of this morainic zone, and these are mainly forested. The Baltic slope to the north is the backbone of the Baltic terminal moraine, crossed by glacial channels (*Rinnensysteme*) that mark later phases of retreat. Such a channel is the so-called Pomeranian valley that divides the north slope into two sectors. The southern (Mecklenburg) slope is cut by several transverse southwest to northeast troughs of sub-glacial origin, but

free of sands. The northern (Vorpommern) slope is traversed by an old east-west water channel. The Pomeranian valley is followed by the Tollense and the Peene, and has connections with the submerged bays of Stralsund and the lower Oder. The Mecklenburg (southern) slope is covered with boulder clay and, like the *Seenplatte*, is divided into sectors by the transverse troughs that contain lakes. Vorpommern has a smoother relief with no lakes and great expanses of sand accompany the longitudinal troughs, but its main peculiarities are due to its coast. But both areas have essentially the same kind of terrain (No. 2 in Fig. 101). (Fig. 102.)

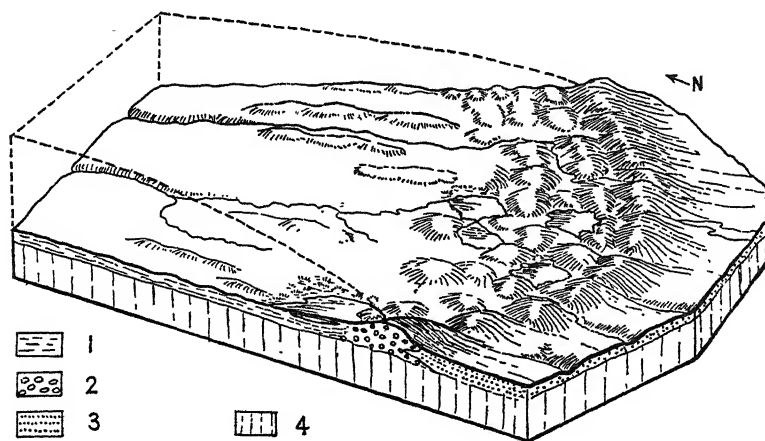


FIG. 102—BLOCK DIAGRAM OF THE BALTIC UPLANDS (from E. von Seydlitzsche, *Geographie*, 1925)

1. Ground moraine
2. Terminal moraine

3. Sands
4. Pre-glacial rock base

Most of the area has an oceanic climate and lacks woodland. In its human relationships it is very closely affiliated with northwestern Germany. The lower Saxon farmstead is still dominant and urban architecture shows the same affinities with the old Germany. Mecklenburg is a zone of early German colonization, though it long retained its Slav ruling dynasties, so that many social and cultural traits are of Slavic derivation. Especially characteristic are land holdings, including great estates, that grew large under German landowners, with the consolidation

Figs. 100 and 101—continued.

2a. *Undulating or Hilly Land. Ground and Terminal Moraines. Sand and gravel soils.* Tangle of low hills, ridges and hollows. Numerous lakes. Dominantly forested (beech and pine).

3. *Undulating Land: Sands and Gravels: Sandy Geest.* Mixture of coniferous forest, heath and arable land, but mainly cultivated (70% arable).

3a. *Low-lying Plains and flat Valley Floors: Sands and Gravels.* Bog, marsh, meadow.

4. *Plains and Low Plateaus: Sand and Gravel.* Dry, entirely forested.

and absorption of scattered peasant strips in the three-field pattern of the villages in the seventeenth and eighteenth centuries. The large peasant village of the west is rare; the normal rural settlement is the great farm and residence of the lord (*Gut*) with labourers and craftsmen grouped around it. Much of this land has been subdivided in the post-war years under the Communist regime.

The density of population is the lowest in Germany. South Mecklenburg, that is traversed by the Berlin to Hamburg railway, is the most thinly settled sector. The lake-plateau between the terminal moraines contains the chief towns—though these are small. Schwerin, a main seat of medieval German colonization, was founded in the twelfth century. It is situated on the banks of a lake, but today it lies off the main railway routes. It is the regional focus of western Mecklenburg (1939, 61,000, 1946, 89,000). North Mecklenburg has good loam soils and an oceanic climate and is a dominant arable tract, with wheat and sugar beet as its chief crops, and an intensive cattle economy similar to that of north-western Germany.

Between the Baltic moraine and the Pomeranian glacial trough lie most of the towns, especially sited at crossings of the transverse valleys, but the majority have only a few thousand inhabitants. Neubrandenburg (12,500), a perfect example of the grid-iron plan with a circular enclosing wall, and Gustrow (28,000) are the chief of these. (Fig. 29c, p. 185.) Rostock (118/115) is the largest city and the cultural focus of the land. It is a "triplet" foundation, established in the thirteenth century next to an old Slav fishing village; it was a Hanseatic port. It is a modern port of modest pretensions, thanks to its outport of Warnemünde, and an important station for traffic to Denmark. It also has a great aircraft plant erected and blitzed during the war, and situated as a separate complex south of the town. The population of the whole is well over 100,000.

Wismar (36,000), another Hanseatic port, has made no modern advance and is an inactive centre, preserving intact its historic build. Wismar sought to revive its prosperity by building a canal to the Elbe like Lübeck (1564–82), but it soon fell into disuse. In 1648 the town fell to Sweden and was not returned to Mecklenburg until 1803. The modern port has many individual shipowners. It imports coal, timber and stone, and exports grain and salt.

Vorpommern resembles northern Mecklenburg in its general features but owes its special character to the coastline, for the formation of long spits cuts off shallow embayments that further west are still open to the sea. These embayments are in no sense favourable to navigation and contain neither towns nor ports. Similar features are found on the island of Rügen where the submerged glacial land formed an archipelago that has been partly interconnected by spits. The coasts include glacial cliffs,

and chalk cliffs, (where the latter outcrops from beneath the surface cover), sand shores, and some sand spits. Stralsund (53,000) is the old town, and though flourishing as a medieval Hanseatic port, it has little importance today and, like Wismar, preserves its historic character. It lies at the head of a bay on an isthmus between the mainland and the isle of Rügen.

The Oder plain, stretching from south to north, bounds Mecklenburg-Vorpommern to the east. The port of Stettin, though now included in Polish-administered territory, has always been closely associated with the life of Vorpommern and Pomerania east of the Oder, and, as a port, with eastern Germany. It has also served recently as an important outlet for Berlin by canal.

Stettin lies midway between Flensburg and Memel at the head of the marshy estuary of the Oder. It is the furthest inland of the Baltic ports and the nearest to Berlin, with which it is connected by rail and water. Beginning as the capital of the Slav province of Vorpommern, on the west bank of the estuary, it became a German town in 1243 and entered the Hanseatic League in 1360. After the Middle Ages, Stettin declined as a port in spite of the fact that the Oder basin was now a closely settled German land in Brandenburg and Silesia. This was because Stettin and Pomerania were cut off from this natural hinterland. Until 1637 Pomerania was independent and then, with the end of its dynastic line, it fell to Sweden, so that Brandenburg and Silesia directed their commerce westwards to the Elbe. This was the reason for the building of the Friedrich Wilhelm canal (1662-9) between the Oder and the Spree to interconnect directly Silesia, Berlin and Hamburg, and to side-track Stettin. In 1719-20 Frederick William II acquired Stettin and the Oder estuary and part of Vorpommern to the Peene river at the mouth of the Oder. In 1815 the rest of the province was acquired by Prussia. The barriers were thus removed and Stettin's development began. The Finow canal was built between the Oder and the Havel (1740-6) and the Plauer canal linked Magdeburg and Berlin. Sweden still controlled the Peene mouth of the Oder at Wolgast in the early eighteenth century, so Frederick the Great founded Swinemünde at the mouth of the Swine, which could take larger ships than Stettin and was ice-free for a longer period. This became the outport of Stettin, until in 1880 the navigation up to Stettin was improved to take vessels up to 10,000 tons. The modern harbour has been built on the marshy islands on the east bank of the river opposite the town. In 1816 Stettin had 24,500 inhabitants—about the same as Lübeck and half the size of Danzig; in 1939 it had 267,000 inhabitants. Stettin was thus the biggest German Baltic port and industrial centre. Shipbuilding is old-established. Blast furnaces were founded in 1895, using Swedish ores and English or Silesian coal.

Other industries are timber- and paper- and oil-milling. The making of cement, bricks and sugar are secondary industries, based on local raw materials. It also has become a chief outport for Berlin, especially since the opening in 1914 of the Hohenzollern canal that takes 600-ton barges. Today, it is annexed by Poland and lies on the western frontier of the "administered area". It thus lies beyond the eastern frontier of Potsdam Germany.

CHAPTER 25

CENTRAL GERMANY (*MITTELDEUTSCHLAND*)

GENERAL (Sheets 7, 8, Figs. 81, p. 499, 104, p. 648)

CENTRAL GERMANY is a convenient term that is often loosely used without an exact connotation. To most Germans *Mitteldeutschland* means the same section of Germany, even though it does not necessarily refer always to exactly the same area. It embraces the middle Elbe basin above Magdeburg south as far as the Czechoslovakian frontier. It is framed by the highlands of Thuringia and Saxony to the west and by the Harz to the north. It opens out northwards to the North German Lowland of which the Saxon Lowland (or Bay) around Leipzig and Halle is a southerly extension. This plain collects the drainage of the Elbe and the Saale and their tributaries from the Erzgebirge. The west-bank tributaries of the Saale drain the lowland of Thuringia that lies between the Thüringer Wald and the Harz. All this area lies within the middle Elbe drainage basin. Physiographically (Fig. 13, pp. 82, 83) the whole area is divided into several distinct units, the Saxon Lowland, that merges through the Saxon Uplands (*Bergland*) into the Erzgebirge, the Harz, the Thuringian Lowland and the Thüringer Wald.

Culturally, the line of the Saale has been one of the most important divides in central Europe, for here the two realms meet, the old German lands to the west, and the Slav lands to the east, into which German colonization and settlement spread in the Middle Ages. This contrast is reflected in the historical development and in contrasts in town and countryside.

Historically, several main political groups developed in this area, from which there emerged a complicated political pattern with a number of enclaves and exclaves with no relation to modern needs (Fig. 55, pp. 330, 331). To the west was the Thuringian group of States, a crazy quilt of small, interlocking political territories, that were merged to form almost one single geographical unit, the Land of Thuringia, in 1921. East of the Saale lay the old kingdom of Saxony whose power waxed and waned, spreading at its greatest extent in 1790 over most of the middle Elbe basin. In the embayment itself was the State of Anhalt, consisting of several detached segments with its capital in Dessau. With the southward expansion of Prussia in the eighteenth century and the weakening of Saxony, the former spread south beyond Magdeburg. In 1815 Prussia

annexed what was for the most part Saxon land to form the new Prussian province of Saxony, within which Anhalt remained embedded. Leipzig thus lay on the northern frontier of the new Saxony, with Dresden, the capital, situated in its southeastern corner. In addition each Land had various inliers and outliers.

The whole area, however, had much in common in its historical development, as well as in the common ties associated with the modern growth of industry and communications. The area is crossed by no natural barriers, it has a natural focal point, and moreover it lies at the convergence of great natural routeways from north to south and east to west.

Economically, it has a rich agricultural heart in the Saxon embayment, which, in general, is encircled by wooded and pasture-covered highland in which agricultural lands are negligible. Handicraft industries had an early start in the highlands of the Erzgebirge and the Thüringer Wald in the form of the mining, smelting, and working, of metals. As these occupations declined, they were replaced by textile working and other crafts. Today, the Thüringer Wald is a highly industrialized area and has many small workshops and domestic handicrafts. In the lowland of Thuringia, on the other hand, industries, such as textiles, are markedly concentrated in its small towns in a rural countryside. Saxony is one of the most highly industrialized areas in Europe. To its medieval metal-working industries and their derivatives, there were added the textile industries in the seventeenth and eighteenth centuries, which were able in the nineteenth century to use the plentiful supplies of running water for power and then to use in some degree small supplies of coal available in the Zwickau field. The fertile lowland of the Saxon bay, however, remained pre-eminently an area of large-scale commercial farming in the nineteenth century, for sugar beet was introduced in the early nineteenth century and thrived in rotation with wheat. But here, too, mining industries began to develop during the nineteenth century. The working of salt and copper on the periphery of the Harz was old established, but grew in importance during the nineteenth century. Then, too, began the quarrying of lignite or brown coal, thick beds of which lie underneath the rich loessic deposits. This new industrial complex attracted new heavy industries, and it also rapidly became a chief source of supply of fuel and power for the factories and towns of Saxony, as well as for Berlin. Thus, this economic development has added to the distinctive geographical character of the main segments of the middle Elbe basin, but has added to the nature and complexity of their relations with each other. In this sense in the modern world central Germany is an entity. Its parts we shall now describe.

SAXON HIGHLAND: THE ERZGEBIRGE (Figs. 4, 13)

The Saxon highland forms a gneissic platform that is steeply faulted to the south in the Eger basin and dips northwards below the deposits of the Northern Lowland. It contains the roots of a series of folded strata with a west-southwest-east-northeast strike. From the summits of the block in the Erzgebirge proper the streams flow northwards. These include, from west to east between the Saale and the Elbe, the Elster, Zwickau Mulde, Flöha-Zschopau, and Freiberg Mulda. They have mature beds on this uplifted peneplain but variations in relief are introduced by differential erosion of the rocks, which run, in general, from northeast to southwest parallel to the summit range of the Erzgebirge. It includes three structural elements, the gneiss highland of the Erzgebirge to the south, the Erzgebirge basin, and the granitic Saxon Upland (*Bergland*). These three main structural divisions also have much in common in their physiographic characters and human activities.

This highland is clearly defined to the south, north and east. There is no such clear-cut break to the west, and here, the mass between the Fichtelgebirge and a line from the Keilberg (1,244 m.) to Zwickau is usually included with the human unit of the Vogtland. The highlands have a crystalline core and a cover of phyllites and schists. In the eastern half, this cover has been removed except for small remnants, and gneiss masses form areas of rounded relief. In the western half, the schist cover remains, though it is penetrated by granite intrusions.

The steep slopes of the Erzgebirge are bounded to the south by a step-fault scarp, that falls by 500 metres to the north Bohemian basin although in some sections series of faults form a steplike slope. In the west, the slope is gradual, broken by small fault scarps, south to the main depression. For 130 km. the ridge of the Erzgebirge has an average altitude of 800 metres. The highest points are the Keilberg (1,244 metres) and Fichtelgebirge (1,210 metres). On either side of this high area, the heights average about 600-700 metres.

The slopes of the main highland range on the northern, Saxon, side are gradual, for it is a great uplifted peneplain. In the east, where the rocks are fairly uniform, there is a monotonous type of rolling relief, but in the west, the granitic laccoliths stand out as residual masses. Basalt hills cap the granite plateau in the east, outliers of the volcanic area of northern Bohemia.

The summit of the Erzgebirge is the watershed; only a few of the swift southward flowing streams have cut through it. The northward flowing streams begin in wide valleys that gradually occupy deeper and narrower valleys in their course northwards; an example is the Flöhatal.

Forest formerly covered the whole of the highland and in spite of

forest clearance through the settlement of miners in the Middle Ages, forest is still dominant. In some of the western districts, forest covers a half of the area; in the eastern districts the proportion is less than a quarter. Like other parts of the Central Uplands, the Erzgebirge was uninhabited until the later Middle Ages although trails were early used by pack mules for carrying salt to Bohemia. Colonization first affected the wooded areas, by penetrating from the Erzgebirge basin and the Eger valley, along either the valleys or the broad-backed ridges between them. Forest villages (*Waldhufendörfer*) were established along tracks which on the Saxon side branched from the *Frankenstrasse* at the foot of the Erzgebirge. Castles and monasteries formed the nucleus of the towns, the oldest of which are situated at river crossings and other dominating focal points, although today these are very small and of little importance. Further settlement was associated with mining. Metals occurred mainly in the contact zones of granite and gneiss. The mining of silver commenced soon after the beginning of rural settlement on the northern border with the foundation of Freiberg in 1163. During the following centuries deeper penetration was effected, and then at the end of the Middle Ages mining flourished in the highest parts of the mountains and many new towns were founded, such as Schneeberg and Annaberg. Tin and copper were mined, as well as iron. Mining settlements also sprang up on the southern (Bohemian) side, as at Joachimstal and Kupferberg. In this way, highland areas with high and rugged relief, quite unsuited to farming, were embraced by human settlement, which thus spread astride the highlands from Saxony to Bohemia. New Bohemian refugee settlers entered during the period of the Counter Reformation. But the import of new supplies of silver from the New World and the exhaustion of the local veins led to the decline of mining. The exploitation of new and deeper veins, the mining of new ores (such as wismuth, cobalt and uranium), and improved methods of mining and smelting, caused a slight revival, and workings persisted till the nineteenth century. Today they are negligible. Freiberg, with 36,000 inhabitants, situated on the barren plateau, 414 metres high, away from the Mulde valley, is surrounded by derelict pits and grass-grown hillocks as evidences of these mining activities. Mining at such high altitudes brought in its train farming. The miners cultivated oats and rye for subsistence, since these were the only crops that were suited to the short growing season.

Industries today are related in part to these old mining and smelting activities. An example is the manufacture of cobalt blue established in 1649. The woodland is the basis of woodworking, paper, and pulp, and glass-making. Local grown flax was used in the linen industry, and lace-making is still carried on as a cottage industry. Water power is used in many factories as in the making of machinery in the Zwickau Mulde, and

woodworking in the Flöha valley. This specialization of industry is favoured by a good road net, for five roads cross the summits to the Eger valley. These industries are widely dispersed in town, village and countryside, in small factories and workshops.

THE VOGTLAND (Fig. 91, p. 550)

At the junction of the western Erzgebirge and the Frankenwald, the highlands are lower and penetrated by the upper courses of the rivers Saale, Weisse Elster to the north, and the Eger to the west. This area has been an important routeway from earliest times, and on account of its importance as a corridor it was placed under the immediate rule of an imperial bailiff or *Vogt*, hence its old name of Vogtland. For the same reason this territory was claimed and divided between the neighbouring states of Saxony, Bohemia and Bavaria. The persistence of the name Vogtland indicates the human unity of the area, although it is physically diverse, and this unity depends on its location as a crossways of natural routes.

The eastern part shares the geological features of the Erzgebirge. Schists are the basement rocks to the east and the high granite massif of the Elstergebirge to the south; while Paleozoic deposits dominate in the Frankenwald to the west. The whole area is an uplifted peneplain with a hilly relief and an average altitude of some 500 metres, sloping in general northwards; it is drained mainly by the White Elster. The streams have shallow beds in broad valleys, and become deeper and even gorge-like further downstream where they are crossed by great viaducts. The gentle slopes of much of the country and the ill-drained surface of its impervious slates give rise to much bog, small lakes and meadow, as well as forest.

Owing to the ease of accessibility of the country, settlers penetrated into it from Thuringia and Upper Franconia and displaced or absorbed the indigenous Slav people, so that customs and speech have characters in common with both sources. Economic development is to be associated primarily with its location on routes rather than with its natural resources. The railways follow the courses of the old roads—the road from Leipzig to Nuremberg, the *Frankenstrasse* in the Erzgebirge basin, and the Bohemian road. The rail net is one of the densest in Germany. Routes from Leipzig run via Hof to Nuremberg, and via Reichenbach-Plauen-Hof to Eger and Regensburg. The Dresden route reaches Reichenbach, while Plauen is the principal rail focus. These two places, Reichenbach (29,000) and Plauen (105,000) are the chief centres of the Vogtland. Since the area has been curiously split up among several states, no dominant focus has grown up. These two towns are also the chief

centres of an industry which is carried on throughout the countryside, in large part as a cottage industry. The earlier crafts, based on local supplies of wood, wool and skins, have been displaced by the textile industry, notably the making of curtain material (*Gardinen*). Markneukirchen is a centre for the manufacture of musical instruments, a craft that was introduced by Bohemian Protestant refugees in 1580.

THE SAXON UPLAND AND THE ERZGEBIRGE BASIN

There is a structural depression running northeast to southwest in the Erzgebirge peneplain that is filled with Devonian and Carboniferous sediments. The rivers flow in a consequent direction right across its grain, and have developed lowlands through differential erosion in soft Devonian sandstones. These rivers are the Zwickau Mulde, Chemnitz and Zschopau. They have wide valleys that are sharply contrasted to the deep valleys incised in the Erz- and Mittelgebirge. Longitudinal tributaries also flow along the strike of the beds. In consequence, the basin has a hilly relief. The whole zone appears as one of lower and more open relief west of Chemnitz. East of this place, however, towards the Elbe Valley, there is an uninterrupted slope from the Erzgebirge. Consequently, the Reichenbach-Dresden railway leaves the basin at Chemnitz and crosses the Erzgebirge plateau. The basin contains the Zwickau coal-field.

North of the basin, the Saxon Upland contains varied outcrops that have a northeast to southwest strike. Granulite is of lower relief with a dendritic drainage, and the surrounding slates stand out as ridges, through which picturesque valleys are cut by the Zwickau Mulde, Chemnitz and Zschopau rivers. At Rochlitz the porphyritic outflows of northern Saxony begin, sinking beneath the glacial deposits of the plain. Thus, considerable variety of rock formations occur—sharp schist ridges, granitic plateau, and red sandstone scarps. This variety is in marked contrast to the monotony of the Erzgebirge highland.

The area is almost entirely one of German medieval settlement. Slav place names are confined to the plain to the north, and occur occasionally on the more fertile soils in the basin. Forest villages (*Waldhufendörfer*) of medieval origin dominate. The towns are situated mainly on the slate scarp (e.g. Rochlitz and Dobeln) or along the rivers. They lie on the old east-west routeway at bridge points and are also outlets for the highlands. Their modern growth has been favoured by the occurrence of coal on the southern border of the basin at Zwickau, Olsnitz and Lugau. Zwickau (112/123) is the chief mining town; the production of coal is about $3\frac{1}{2}$ million tons. Chemnitz is the capital of the textile industries and also has engineering industries. Industry has spread throughout this

district to the smallest villages and there is a close network of roads and railways. From the nucleus of Chemnitz (335/250) houses and factories spread in continuous belts along the valley floors, while the intervening uplands are wooded and relatively thinly settled. The density of population in the district around Chemnitz is 1,200 persons to the square kilometre.

SAXON ELBELAND AND DRESDEN BASIN

The Erzgebirge block strikes in the east against a depression with a northwest to southeast strike which, on its far side, is bounded by the Lusation block. A variety of physiographic features appear in this area. A plateau of horizontal sandstones lies between the two granite blocks south of Pirna. This plateau, cut by deep and narrow valleys (called *Gründe*), is thickly wooded and thinly peopled: tourism and quarrying are its only sources of livelihood. This is the *Elbsandstein Gebirge*. A zone of rolling and closely settled hill country lies on the west side of the Elbe, between this plateau and the edge of the granite hills of the Erzgebirge. Below Pirna the Elbe sandstone highlands give place to the Dresden lowland which is bordered against the Erzgebirge by the Döhlen coal-field. The Saxon Uplands and the Lusatian Uplands are connected at Meissen by low granite hills and thus enclose the Dresden Basin. The whole basin, for the most part hilly country, is drained by the Elbe and centred on Dresden.

The *Dresden basin* is a structural continuation of the Elbe sandstone plateau, although unlike the latter, the faulted basin contained calcareous marls that have been eroded to form a lowland on the granitic base. This base encircles the basin, which is sunken by some 100–200 m. The granite country to the north is covered with glacial sands, and heath and woods reach to the edge of the Dresden lowland. To the south, schists form a rolling country with a network of valleys; it is partly covered with loess, and is closely settled. It also contains a small coal-field that is a continuation of the Zwickau-Chemnitz depression (Döhlen). To the north the granite hills are low and inconspicuous (Spaar Geb.). An outcrop is undercut by the Elbe and was chosen by the Germans as the site of one of their earliest settlements in this originally Slav land—a fortified cathedral and castle on the hilltop on the left bank of the river (cf. Magdeburg). The basin itself has fertile marl soils and in part a cover of loess, and the slopes of the bordering hills are clothed with vineyards and orchards. Southeast, beyond Pirna, lies the constriction of the Elbe valley in the wooded sandstone plateau.

In this originally Slav area, the Germans established their first outpost at Meissen, and subsequent bases were founded at Dresden and Pirna.

The former was intended as a principal river crossways and was founded as a *Kolonialstadt* on marshy ground, with a grid plan and central square market, in the early thirteenth century. Another market place (*Neumarkt*) was established at the end of the Middle Ages and the whole was enclosed by a wall (*Altstadt*). The wall was removed in the early nineteenth century and replaced by the boulevards called the *Ring*. Another extension was absorbed on the opposite bank in the seventeenth century and became the *Neustadt*. The city early became the capital of the Electors of Saxony and it was they who, in the eighteenth century, erected magnificent Baroque buildings, gardens, and museums. Then in the nineteenth century came industrial development. Light industries are characteristic of the city. Around Dresden there is a cluster of small towns and a small coal-field to the southwest in a thickly peopled area (*Freital*). The urban area extends upstream to Pirna and downstream to Meissen (pottery based on local kaolin), but the forested plateau to the north sharply limits the urban area against the country of Lusatia. This whole conurbation has a population that is not far short of one million inhabitants. Dresden itself (630/468) is often referred to as the Florence or the Garden City of Germany, for, in addition to its fine buildings and art treasures, the middle-class single-family or apartment house is characteristic, rather than the monotonous tenements that are so common in other cities of eastern Germany.

UPPER LUSATIA

The hilly land of Upper Lusatia embraces, the north of the great granitic mass in the northeastern corner of the Bohemian Massif, and stretches from the Elbe east of Dresden to the upper course of the Bober river. It is traversed by the northward-flowing headstreams of the Spree and the Neisse. The Tertiary-filled trough of the Neisse separates the Lusatian from the Iser granite blocks with a northwest-southeast trend. Much of the area is covered with loess, but rolling surfaces with a loess cover merge northwards into the low-lying plains of glacial deposits. Low granitic hills, reaching 500 to 600 metres, rise from the rolling surface. Westward the area merges into the sandstone plateau that is traversed by the Elbe before entering the Dresden basin and short streams are deeply etched into the granite slopes on the western edge. Most of the granite upland was smoothed by ice at its most southerly extension.

The Neisse trough is continued southwards in the faulted trough that above Zittau assumes a southeast to northwest course, and is bordered by a range of highlands, the Lausitzer Gebirge. This is the Lusatian Gate that leads to Reichenberg and so to Bohemia. In these highlands the granite is capped by horizontal Cretaceous deposits that are part of the

faulted platform of northeast Bohemia, and here, too (as in the latter area), there are groups of basaltic hills. Altitudes of 700 to 800 metres are reached at the highest points. Diluvial sands and gravels find their most southerly limit in this trough.

Upper Lusatia forms a distinct politico-cultural unit, that has been closely allied with Lower Lusatia, which long was an extensive, unpeopled area to the north. Upper Lusatia was closely settled and its life dominated by the cities that lay at the junction of highland and the lowland on one of the great east-west highways of Europe. Of these towns, Görlitz is the chief, but there was a historic union of its six principal towns. The south is highland and still largely wooded; the north is covered with sand, loam and loess. In the southern forested sectors are forest villages of German origin. The more fertile northern sector was peopled by Slavs who were later absorbed by Germans, though there are many *Rundling* villages of Slav origin. Infertile soils in the west, including heath-covered sands, are more thinly peopled. In the south, as elsewhere in the highland, the population is engaged in crafts, and from the early cultivation of flax and cottage weaving grew the modern manufacture of linen. The main zone of the textile crafts in the highlands of the Sudetes starts in the highland of Lusatia around Rumburg.

The towns lie at the foot of the highland on the historic east-west highway that runs from Dresden through Bautzen (38,000), Lobau (12,000) and Görlitz (80,000), and thence to Silesia. The great prehistoric route-way used for the trade in amber from the Baltic shores to Bohemia and beyond followed the Neisse valley. The convergence of these two historic highways accounts for the important space relations of Lusatia, and in consequence, its cultural, commercial and political significance. For a long time, the area belonged to Bohemia. The main railways, however, tend to run east-west to Silesia and lie well to the north of Lusatia. Moreover there are poor rail connections between Prague and Görlitz. The area has today a relatively small density of population and a small number of towns and of industry as compared with its neighbour Saxony.

THURINGIA

The state of Thuringia was established in 1921 by the mergence of a number of separate states and territories that occupied roughly the same area as had been covered by the dukedom of Thuringia for many centuries prior to its disintegration. The state as a political unit extends westwards beyond the Thüringer Wald to the upper Weser valley, eastwards well beyond the river Saale, northwards as far as the depression of the Goldene Aue at the foot of the Harz, and southwards to the slopes of the Frankenwald and the Saxon Uplands. The term, however, for

purposes of this study, may be regarded as the lowland that is drained eastwards by the Saale and the Unstrut and is enclosed by, and includes, the highlands of the Harz, Thüringer Wald, Frankenwald, and the western border of the Saxon Uplands. Its extent is more or less clearly defined from the physiographic point of view by the extent of the Triassic strata, sandstones, limestones and marls, of which it is composed. These strata open out to the east to the lowland of the Elbe and are partly buried beneath younger strata around the eastern end of the Harz; and southeastwards, beyond the Saale, they form a forested plateau of sandstones. The whole of this area, except the western half of the Harz, the western end of the basin (that is drained westwards to the Leine), and the Thuringian highlands, was covered by the maximum extension of the Ice Sheet and owes some of its surface features to this fact. Most remarkable is the large extent of wind-blown loessic deposits in the lowlands in the centre of the basin.

THE THÜRINGER WALD (Sheet 11, Fig. 91)

This forested highland has long served as a frontier zone. After the victory of the Franks over the Thuringians in 531 it became the frontier zone between these two ethnic groups and separated the two great areas of Frank and Saxon law. It also divided the medieval dioceses of Mainz-Erfurt and Naumburg from the southern German bishoprics of Würzburg and Bamberg. The upper Werra lands on the south side of the Wald are part of Thuringia; they differ from Franconia in religious and political allegiance, but are allied to these southern lands in the character of their people. The settlement forms are also allied to those of Franconia as is evidenced by fortified villages and Frankish farmsteads. Thus, the economic and cultural boundary of Thuringia does not lie on the watershed of the highland but on its western border, and actually reaches south in the *Westergau* to include a part of the Bunter sandstone plateau.

The surface relief of the Thüringer Wald is due to its uplift as a horst above the surrounding Trias lowlands. Its borders are formed in general by northwest to southeast faults, but, in detail, the fault front is jagged, like a piece of wood broken across the grain. These fault lines are Hercynian in direction and cut across the northeast-southwest strike at right angles, with a Variscan trend. Several lower basins and saddles may be recognized on the surface of the highland that tally with this Variscan trend.¹ Remnants of the *Zechstein* deposits formerly covered the whole peneplain and today enclose the north and northwest foot of the highlands. The Wald proper is built of sedimentary and eruptive

¹ From southeast to northwest these are the Ziegenrück Basin, the Schwarzburg Saddle, the Oberhof Basin, and the Ruhla Saddle.

rocks of the *Rotliegende* series (conglomerates, sandstones and porphyries) through which there outcrop granites, mica schists, and quartzites. Beyond a line from Gehren to Lichtenau lies the slate massif of the Thuringian Highland, an extensive uplifted and undissected plateau of Pliocene date.

The diversity of rock outcrops results in a diversity of local land forms. Low rounded hills are formed on the schists. The highest ranges 900 to 1,000 metres high are on the porphyries, in which also are cut deep gorges. Differential erosion of hard and soft Paleozoic strata gives a scarped landscape near Eisenach. The *Zechstein* beds form a depression on the border of the Wald, that is overlooked by sandstone and limestone hills.

The Thüringer Wald was settled at a relatively late date. Only a few mining settlements on the periphery appeared before A.D. 1000 to exploit iron, copper and cobalt in the *Zechstein* beds. The inner highland remained an uncultivated area and uninhabited, except for wandering miners and smelters, who were miner and smelter in one. Settlement commenced in the twelfth century with the establishment of monasteries and, later, through the encouragement of territorial lords. This settlement was associated primarily with the use of the rich timber, water resources and minerals. The valleys were dotted with mills and hammers. Urban life flourished on the edge of the highland. The making of small firearms developed at Suhl, that became one of the chief seats in Europe; and the making of iron wares concentrated around Schmalkalden. But the exhaustion of the minerals, and the competition of foreign supplies, and the depletion of an accessible timber supply and lastly, the Thirty Years War, involved the decline of these industries in the seventeenth century. There was thus room and need for new industries to support the unemployed population that could not support itself from cultivation. Glass-making was developed during the sixteenth century and porcelain-making at the end of the eighteenth century, while textile making, depending entirely on outside supplies, has more recently been added. Meanwhile the iron-working industries became a domestic industry at the end of the seventeenth century.

Domestic handicrafts have remained a main feature of the industrial economy of the whole region, although the industries themselves and the resources they use, have completely changed. Many places have often changed from one industry to another. Only slate quarrying and woodworking depend on local raw materials. The only iron-working industry has recently finally died out. All the other industries are labour-oriented. These skilled workers, particularly woodworkers, depend on foreign markets and the competition of foreign imports brought crisis to them in the inter-war years. This applied to both

the principal industries, the glass industry and the manufacture of toys. The latter in 1930 employed 9,000 persons, two-thirds of whom were domestic workers (Sonneberg). The porcelain industry is sited in the northwestern sector of the highland. The industries carry on the old iron-working tradition on both margins of the highland. They are especially important on the western side, where nails, rifles, precision instruments, wire, and machinery are produced at Schmalkalden, Brotterode, Suhl, Saalfeld and Ruhla. Many local specialized industries appear also, such as match-making at Neustadt. Even the inland holiday resorts are also industrial, like Waltershausen and Ilmenau.

Agriculture, on the other hand, is of very little importance in the overall economy. Holdings are small and the normal farmstead is replaced by the small timber-built house with a slate roof (*Schrothaus*) that serves as farmstead and workshop, while the village settlements are strung out in the shelter of the valleys. Forest far outweighs cultivated land in this "green heart of Germany." The northwestern sector of the highland was formerly covered with deciduous forest with beech on the lower slopes and spruce on the upper slopes, while east of Schmalkalden the coniferous forest covered virtually the whole forest area. The Thüringer Wald has an added resource in its tourist industry, in both summer and winter. Health and bathing resorts lie on its northeastern border. One of these centres, Ilmenau, has over 10,000 inhabitants due to the concentration of industry, while several industrial towns on the opposite side have between 10,000 and 15,000 inhabitants, headed by the industrial centre of Sonneberg (19,000).

The Thüringer Wald is crossed by old routeways, but only one railway crosses it, and this is the main route from Berlin via Erfurt to Stuttgart. Other routes cross the more even surfaced plateau of the Frankenwald and another passes the northern end, between the Thüringer Wald and the Ringgau, where at the foot of the castle-crowned hill of the Wartburg, Ludwig II founded Eisenach in the middle of the twelfth century. Routes converge on this town from Hesse and continue eastwards along the old highway called the Königstrasse to Erfurt. Modern industries, including engineering and textiles, are clustered here and add to its commercial importance (50,000).

THURINGIAN LOWLAND (Figs. 81, 91)

This lowland nucleus lies in the heart of the Reich at the convergence of historic highways from east and west and north and south. It lies at the junction of the old Germany and the original Slav lands, that were colonized by the Germany after A.D. 1200.

Inner Thuringia is a basin between the Harz and the Thüringian-

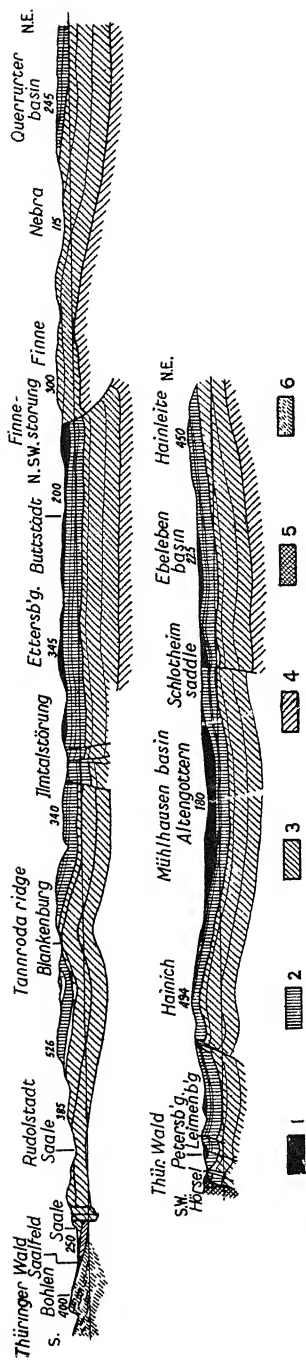


FIG. 103—GEOLOGICAL SECTION THROUGH THURINGIA (Reproduced from G. Braun, Deutschland, 1933, p. 173) (scale, 1 : 500,000)

Section from south in the Thüringer Wald to north at the Finne Fault (*Störung*), thence northeast to the Hainleite. Note the alternation of basin or syncline (German, *Mulde*) with ridge or saddle (German, *Gewölbe*, *Sattel*).

1. Keuper 2. Muschelkalk 3. Buntsandstein 4. Zechstein 5. Rofligendes 6. Kulm

Frankenwald-Vogtland Highlands to the south. It is a basin of Mesozoic rocks, arranged like a saucer-shaped depression. Magnesian limestone (*Zechstein*), Bunter sandstone, Muschelkalk and Keuper beds succeed each other from periphery to centre, although the regularity of outcrops and the physical features in detail are affected by small horst blocks and fault troughs. The relief has been modelled by differential erosion upon a Pliocene peneplain. Scarps face outwards, the scarp-formers being the harder middle Bunter and Keuper sandstones, and, above all, the limestone known as *Wellenkalk*, that forms the Hainleite and Dun to the north, an upland with an almost continuous, bold, north-facing scarp. The northern Ice Sheet, that reached south to cover most of the area to Mühlhausen, Gotha, Erfurt-Weimar and Weida, altered much of the initial drainage that was consequent upon this structure. The streams that flowed northwards into the lakes dammed at the foot of the Ice Sheet were diverted to east and west, as appears clearly, for instance, in the drainage pattern just south of Gotha between Eisenach and Ilmenau. The centre of the basin has sunken through the solution of underground salts as well as through the surface erosion of the soft Keuper marls. Depressions are occupied by the wide valley floors at Mühlhausen and Langensalza along the Unstrut river, Gotha-Arnstadt-Erfurt, and the former marshy plain at the confluence of the Gera and Unstrut rivers. In the harder rocks the valley slopes are steep, and gravel-covered remnants of old valley floors are preserved as relicts of diluvial uplifts. A series of remarkable terraces lines the middle Saale. This river flows in entrenched meanders through the old rocks to the south and widens out between Saalefeld and the Leipzig bay. Especially remarkable is the course of the Saale through the Muschelkalk (from Lubeda to Naumburg), where meadows lie on the floor, vines cover the red sandstone (*Röt*) slopes and the steep, craggy cliffs of the *Wellenkalk*, on which there appear relicts of the steppe-heath flora.

The landscapes of Inner Thuringia fall into a threefold grouping and reflect the geology. They are shown on Figs. 80, 81, pp. 498-9. The wide, outer girdle of limestone (Muschelkalk) plateaus slopes gently inwards to the low hill and plains country of the Keuper marls, and their outward-facing scarps overlook the wooded Bunter sandstone plateaus. The sandstone plateaus are known as the Eichsfeld in the northwest and the Finne in the north, and the same sandstones form a monotonous extensive forest plateau in the east between the Saale and the Weisser Elster. The limestone platforms include the Ilm-Saale plateau in the east, the Hainleite, Dun and Eichsfeld plateaus in the north, and the Hainich in the west. These are arable lands with beech forests on the wetter north-west and western slopes. Karst features are also well developed. Refer to the geological section (Fig. 103) and the map of a type area on Fig. 121.

The heart of the basin has a base of Keuper marls and a cover of loessic deposits that yield real black earth soils or chernozems. With a rainfall of less than 550 mm. per year, this is one of the richest arable lands of Germany and in it today, as in prehistoric times, there is virtually no woodland. Nine-tenths of the land on the Keuper marls and loess is under arable cultivation. Wheat, barley, sugar beet and lucerne are rotated in a free rotation on an improved three-course system. Every piece of earth is used and divided into a variegated quilt of unhedged field strips; around Erfurt market gardening is important. Minute and divided holdings cover two-thirds of all the holdings, while one-fifth are considered to be self-supporting. The vine was introduced by the monks in the tenth century, but today it is only found in a tenth of the four hundred places where it is reported as being grown in the fifteenth and sixteenth centuries.

The dense rural settlement is closely adjusted to the fertility and accessibility of the central plain, the break-up of the latter into several separate sectors, the barrier of the encircling scarps of the limestone plateau, and the deep transverse valley of the Saale. The limestone scarps formed the historic defence line of Thuringia, and medieval castles were situated on craggy hills lying beyond the main scarps, as well as on the scarp itself. Similarly, old fortresses and later castles were built along the valley of the Saale as outposts against the Slavs. The Wartburg, for example, lies on a hill overlooking Eisenach, and similar old German fortresses guarded the gorge of the Unstrut at the Thuringian Gate at Heldrungen, while Naumburg guarded the exit of the Saale into the Leipzig bay, and Creuzburg and Brandenburg guarded the Werra passes. A cluster of castles, sited on residual limestone hills in front of the main scarp, rise above the sandstone plateau in the northwest of the land. An example is Bleicherode, that controlled the routes along the low watershed between the Leine and Wipper (Eichsfeld Gate), as well as the passes in the limestone scarp. Kurmainz, from its local capital in Heiligenstadt, fused the northwest into a single unit. This is known as the Eichsfeld and it is to this day a Roman Catholic island surrounded by Protestant-speaking country. Of all these routes and passes, Eisenach alone retains its historic importance.

Prehistoric settlements of all periods are represented in the central lowland. The Germans came from the north. German suffixes such as *a*, *ahn*, *ar*, *mar* and *lar* and *stedt* date from the earliest period of settlement (before A.D. 300); the second phase (300–531) includes settlements with names ending in *ungen* and *leben*; the third phase (531–800) with names ending in *hausen*, *heim*, *bach* and *dorf*. Settlement took place during the *Rodungszeit* until about 1300. Indeed during the period 1350–1500 numerous villages disappeared and were absorbed by

neighbouring villages. In east Thuringia the Slavic Sorbs entered about A.D. 650 and settled as far west as the Ilm and the Gera rivers, although they were later pushed back eastwards beyond the Saale. The whole area they evacuated west of the Saale was later settled by the Germans, though Slav place names and village settlement forms are frequent.

Towns developed early. The majority are planned foundations that began as market centres and fortresses. Many were planned adjacent to old fortresses and several adjacent to ecclesiastical seats, as at Erfurt and Naumburg. A particular feature is that the oldest—and these include the chief towns of today—are spaced at equal intervals along the main routes that radiate from Erfurt, the capital. In the towns the half-timbered eaves house with a tiled roof is characteristic. The growth of towns was fostered in the centre of the basin by the close rural settlement of the land and by territorial disintegration. The splintering of the territories of the old duchy of Thuringia arose from the laws of inheritance of the Ernest dynasty. This is also the reason for the large number of royal residences, built in the fifteenth to the seventeenth centuries, the hey-day of the Ruritanian State. The towns also are responsible for most of the industry. The industrial structure in the east shows similarities with Saxony, while that of the west approximates to that of the Thüringer Wald. The making of glass and optical instruments is concentrated in the small university town of Jena. The porcelain industry is located in Stadroda and ironmongery in Arnstadt. There are seats of the textile industry and machinery making at Apolda, Gera and Possneck.

There are eight medium-sized towns in Inner Thuringia west of the Saale—Jena (68/83), Weimar (62/67), Gotha (52/58), Eisenach (50/52), Mühlhausen (41/48), Naumburg (34/41), Apolda (28/33), and Arnstadt (23/28).

Erfurt (159/175), the capital, began on a limestone hill, the Petersberg, on which was located the royal settlement. The embryonic urban settlement grew around the cathedral at the foot of the hill on the bank of the Gera river at a ford. The river served to divide the German settlement on the west bank from the Slav settlement on the east bank. The line of an inner circle of streets marks the course of the oldest wall (1168), while the belt of open spaces and public gardens and the *Flutgraben* mark the site of the outer fortifications (1480), that were demolished in 1873. As a frontier town between the Germans and the Slavs, Erfurt became an important route focus and developed early industries, notably that of treating woad that was grown in its environs. Its medieval importance is revealed by the foundation of a university in 1392. Its prosperity continued into the Renaissance period and well-preserved houses of this period are found in the town. But then it declined at the expense of Leipzig and Breslau, so that in 1800 it had only 14,000 inhabitants as

compared with 20,000 in 1500. In 1906 its population reached the 100,000 mark as the economic focus of Thuringia. Clothing and boots and shoes are its chief manufactured products, and in its immediate environs a horticultural industry of old standing is pursued.

THE HARZ (Fig. 81, p. 499)

The Harz is a highland block that rises abruptly from the surrounding lowlands in the western section and slopes steadily and gradually eastwards to merge into the lowlands beyond Mansfeld. It is bordered to the north and east by a so-called Foreland, in which low hills of folded Mesozoic strata rise above the open, flat or undulating, loess-covered plains. To the south it is bordered by the depression of the Goldene Aue, a depression between the edge of the Harz and the scarp of the Dun and Hainleite. To the west lies the Leine depression. (Fig. 82, p. 502.)

The highland falls into three sectors—the western or Oberharz, the central or Unterharz, and the eastern Harz. The description of the Harz by the medieval miner as “Es grüne die Tanne, es wachse das Erz” applies only to the western and central sections of the whole physiographic entity. The eastern section was originally covered with beech forest and was largely cleared in the Middle Ages, so that the forest is now confined to the valleys.

The Mittel and Oberharz are the true Harz. They have three main relief features—an undulating plateau surface, decreasing from 1,000 metres in the west to 500 metres in the centre; ridges and hills that rise above this plateau, the highest of which, the granitic mass of the Brocken, reaches 1,142 metres; and the deeply dissected border zones to north, west and south, where the streams, issuing from the high plateau, cut deeply into the highland edge on their way to the surrounding lowlands. The northern border is a fault zone. The southern border is a *Kippscholle* (without faults), where the Paleozoic beds dip beneath the Mesozoic strata of Thuringia. It is bordered to the south by a lowland, eroded in the Zechstein, from which the glistening white hills of a gypsum scarp rise 100 metres and face the highland from Sangerhausen to Osterode. In these hills Karst features are well developed. Geologically, the highland consists of the stumps of a folded massif in which Paleozoic rocks outcrop with a high dip and a Variscan trend. It is not clear just how far the surface features of the plateau are due to various erosion levels or to the resistance of its strata.

The northwestern Harz has a heavy precipitation that reaches over 1,500 mm. in the Brocken, whereas the eastern and southern sectors, lying in the rain-shadow area, are remarkably dry. Moreover, since most of the precipitation occurs in winter, the streams carry double as

much water in winter as in summer. The winter snows, however, cause devastating floods in the surrounding lowlands in spring. Summers are cool and damp and the wet conditions account for the high bogs on the plateau. The highland is forested with spruce, above a zone of firs, but there are many clearings, especially in the Unterharz. Three-quarters of the Oberharz is forested.

The presence of minerals early attracted settlers. Minerals occur in veins with a west and northwest strike, which contain lead, zinc, silver, copper, iron, and manganese. Already in A.D. 970 we hear of silver-mining at Rammelsberg and this led to the foundation of the town of Goslar that became both an Imperial and a Hansa city. The mining of minerals was carried on by the monasteries from the eleventh century onwards. Mining, however, died out after the Black Death in the mid-fourteenth century, but a revival came at the end of the fifteenth century and after. It was in the Reformation period that seven mining towns were founded. Miners from the Erzgebirge then settled in Clausthal and Zellerfeld and their dialect persists there today. More than thirty places owed their origins to mining and smelting from the thirteenth to the sixteenth centuries. But the second prosperous period was brought to a standstill by the Thirty Years War. There was a slight revival in the eighteenth century, but the industry died out during the nineteenth century, and since the 1870's the population has decreased. The only survival and hope for the future is Rammelsberg, where new veins were discovered in the mid-nineteenth century. But the past mining activities are still reflected in the aspect of the towns, especially in Clausthal (that has had a mining academy since 1775), in the forest clearances, and in the canals and ponds that were dammed for purposes of working the forges. There are sixty-seven dams in the environs of the Clausthal, most of which date from the eighteenth century.

Forestry, tourism, and water-resources, are the chief activities of the Harz today. Many barrages are planned to generate power and to supply drinking-water. Drinking-water is piped to Bremen from the Sösetalsperre in the western Harz. Winter sports are a great attraction in the Brocken and there are many health resorts in the Harz. Many small towns on the northern and southern borders owe their origins to dynastic castles adjacent to which they were laid out at the valley exits; an example of such a town is Blankenburg. Some of these places are seats of industry as well as of the tourist trade. Goslar (25/36) is a mining town and a health resort. The Kyffhäusergebirge is a small replica of the Harz, scarped steeply to the north and sloping gradually southwards.

THE HARZ FORELAND: THE GOLDENE AUE

The lowland on the south side of the Harz between the Kyffhäuser and the Harz, is traversed by the meadow-covered floor of the Helme river and its continuation by the Unstrut river. This is loess-covered undulating, arable land. The river plain was a reed-grown marsh (*Ried*) until it was drained by Flemish colonists in the twelfth century. The eastern Harz merges into a lowland that is for the most part covered with loess and is open arable land. This is a characteristic sector of the *Börde* country that stretches between the Harz and Magdeburg and widens out eastwards to cover much of the middle Elbe basin. The loess blanket covers the solid rocks that are closely related to those of the Harz. Low ridges rise as anticlines with a Variscan trend, as the last outliers of the Harz, and enclose two intervening synclines of strata of Zechstein, Trias, and Eocene brown-coal deposits. These form low plateaus in the areas of Mansfeld and Querfurt. The Saale cuts through these various rocks between Weissenfels and Halle.

This is one of the driest areas in Germany, with 400 to 450 mm. per annum. Its primitive vegetation was forest-free from the earliest days of human occupation. This is predominantly today a farming area, but the underlying rocks supply copper near Mansfeld. Mining began here in the twelfth century, flourished in the fifteenth and sixteenth centuries, was completely destroyed during the Thirty Years War, and then revived in the seventeenth century. Seams are less than one metre in thickness and the ore is low in metal content, but these are the only sources of copper and silver in Germany. Mining goes steadily deeper and is shifting to the east. The chief centre is the hilly country around Eisleben (23/29) that is surrounded with grey dumps of mined waste. The mining of lignite around Geiseltal and Weissenfels has been more recently introduced. Rock salt occurs in the *Zechstein* beds around the periphery of the Harz, and is especially important around Stassfurt in the Magdeburg area. Potash salts became of great importance after about 1860 and the Harz foreland area is responsible for about 70 per cent of the world's production. The chief seats of production, however, have shifted westwards to the south side of the Harz and to the Werra valley.

THE SAXON LOWLAND (Fig. 81, p. 499)

This is the extensive plains country into which the foothill country of the eastern Harz imperceptibly merges. It stretches southwards into the Saxon Uplands and the Erzgebirge and westwards into the forested uplands of the sandstone plateau above Naumburg and Zeitz, while west of the Saale around Halle it merges through the low hills of the

foreland zone into the eastern Harz. This plain is roughly defined by the 200-metres contour and into it drain the Saale and its branches from Thuringia and the Weisse Elster, a tributary of the Saale, and the Mulde, that drains most of the highlands of Saxony northwards to its confluence with the Elbe. The two focal points of the plain are the cities of Halle on the Saale river and Leipzig on the Pleisse river. The whole area, as well as the Thuringian basin, was covered by the most southerly extension of the Ice Sheet. Plains and broad, flat valleys characterize the bay from these neighbouring areas and a series of towns lies at the points where the river valleys change in character on the edge of the plain—Grimma on the Mulde, Altenburg on the Pleisse, Zeitz on the Elster, Weissenfels on the Saale. The old glacial forms have been smoothed off to form a plain that extends north to the most southerly of the glacial troughs that stretches from Breslau to Magdeburg. This is crossed by the Schwarze Elster, the lower Mulde, and the stretch of the Elbe below Meissen to the confluence of the Saale. The southern limit of the fluvio-glacial deposits of the north German lowland stretches from Dresden to Magdeburg. South of this line lies a great area of loess (Fig. 11). Thus, the southern and western sections of the Saxon or Leipzig bay contain extensive loess deposits.

This lowland bay is a great focus of natural routeways that enter through the Thuringian Lowland, and cross the Thüringer Wald, the Fichtelgebirge, and the Erzgebirge. It is an area of arable land and is cultivated in medium-sized holdings from compact village settlements. The economy normal to such lands is practised, with a rotation of wheat, sugar beet and lucerne, and a high output of stall-fed stock that are reared for both their meat and their milk. On the maps of Germany this area stands out distinctly in respect of its fertile black earth or chernozem soils, the very high proportion of arable land to the total area (70 per cent and over of the total area), and by the predominance of its particular type of rural economy.

The same area is also one of the chief seats of industry in Germany. This development, however, is recent. It dates from the middle of the last century. For here are the chief lignite fields of Europe, producing within the small circle around Leipzig and Halle one-third of the total production of Germany, two-thirds if Lower Lusatia east of the Elbe be included. The growth of brown-coal production in Germany and the type of industries associated with it have been discussed (in Ch. 10). Brown coal was quarried as a fuel for use in the neighbouring sugar-beet factories, that began to be established in the first half of the nineteenth century. The chief stimulus, however, came after the turn of the century, with the advance of methods for the extraction of fuel from the raw lignite in the form of briquettes, with the distillation of the fuel in a similar

way to the distillation of bituminous coal, and with the use of the fuel directly in plants of special design, and as a source of fuel in chemical plants (especially after nitrogen could be extracted from the air), and, finally, as a fuel for the generation of thermal electricity.

Adjacent to the quarries are briquette-making plants, brickworks and chemical plants, such as the Leuna works, and giant electricity plants (Pl. 7). Some of these plants are situated near to the Elbe waterfront in or near small historic towns such as Bernburg. The Leuna works is also situated near to the Geiseltal, whence it draws brown coal, and it is adjacent to the old town of Merseburg. Workers' houses are also situated in the smaller towns so that there is normally a great volume of local traffic from home to factory along the roads of the open countryside by road or rail. Halle is the main focus of this new industrial growth. Its products find wide markets in Germany, but particularly close is the commercial tie-up with central Germany which is dependent on this area for its fuel and electricity. The Golpa-Zschornowitz plant, the second largest in Germany, supplies chemical works, Berlin, and the power grid. Böhlen plant, almost the same size, supplies a synthetic oil plant, Leipzig, and the power grid. Two other stations were completed during the war and have only a slightly smaller capacity (300,000 kilowatts). Other plants feed factories at Lanta, Bitterfeld and Wolfen and Leuna.

Leipzig and Halle are the two chief historic and modern urban centres of this agricultural-industrial complex.

Leipzig (702/608) is the chief seat of the printing and textile industries and agricultural machinery, and has also a diversity of industries (Pl. 12). It began as a *Kolonialstadt* at a break of bulk point for trade with the east. Its site was a tongue of raised land jutting west between the marshy plains of the Elster-Pleisse to the west and the Parthe to the north. The Altstadt is bounded today by wide boulevards beyond which a girdle of built-up land was in being by the mid-nineteenth century. Later extension took place to north, east, and south, while the plains to the west have remained mainly as parks and open spaces. Modern growth was somewhat retarded by its position on the frontier between Saxony and Prussia, for the latter developed Halle as its main railway focus. The main railway enters from the north where, just outside the Altstadt, one of the largest stations in Europe was built in 1905. Other stations from Saxony lie on the southeast outskirts. It, thus, follows that the widely extended urban area is broken up by non-residential areas and reach to the edge of the boulevards of the Altstadt. The lack of a navigable waterway has been a disadvantage, but the construction of the Elster-Saale canal will remedy this defect in part. The city was the seat of the supreme law courts of the Reich and has a university dating from

1409, and it is a great centre of the printing and book trades. But it is probably best known for its ancient fairs which still contribute to its principal modern activities. *Halle* (217/222) is smaller and more one-sided in its interests, since it has become an industrial and commercial focus for the brown-coal area. It is, however, one of the most historic towns in Germany and has a famous old university (1693). The salt springs of its environs attracted early man and here, on the right bank of the Saale, the Frankish *kastell* was established in 806. The city is today the seat of important new industries—brown-coal-mining, sugar-making, engineering and electricity production. It owes not a little of its modern growth to its selection by the Prussian Government as a railroad focus in the mid-nineteenth century at the cost of Leipzig that lay just inside the frontier of the separate and independent state of Saxony. It also has a university. Merseburg (25,000), established originally as a border fortress against the Slavs, is today in close proximity to the massive chemical plant of the Leunawerk.

Many of the smaller towns are well-preserved historic towns that have now one or several large plants attached to them with a considerable growth in the number of people and houses. Such are Bernburg (42,000), Dessau (112,000), the ancient capital of the Anhalt and the seat of one of the chief aircraft plants of Junkers, and Torgau (13,500).

THE UNITY OF MITTELDEUTSCHLAND

The middle Elbe basin is given this name for a great variety of purposes in the life and organization of its peoples. These common social relationships are based on a diversity of modern activities, that are in large degree interdependent, particularly in so far as the whole area relies on the lignite of the Saxon bay and the electricity derived from it. But its unity is also based on general propinquity of the many large urban centres of the area that are dominated by the larger cities of Dresden, Leipzig, Halle and Magdeburg. This unity is found also in the contiguity of a group of states that in peace and war have been closely associated with each other in the past no less than in the present. The incursion of Prussia in the north disrupted the old political relationships. But the new divisions of the early nineteenth century and the subsequent modifications of them were based on the patterns that emerged in the Middle Ages. In other words, the unity of this area, however vaguely defined in general (as it must be), is based, as in every other large area that comprises a diversity of contiguous units, upon its space relations. These relations are reflected in the functions and distribution of the towns and the routes. It is therefore appropriate to turn, in conclusion, to the movements of goods,

persons and ideas in this part of Germany, in order to determine just how and how far it constitutes a geographic entity.

There are deep-rooted contrasts in the economic development and the present character of the industries as well as of agriculture between the northern and southern sectors of Central Germany. The whole area, however, is a homogeneous unit in respect of four main characteristics in its circulations and organization. It has a close network of through and local routes. There is an old-established interchange of goods between its parts, which is now so important, in comparison with trade with other areas of similar extent in the Reich, as to mark it off as an integrated commercial unit. Brown coal is the chief item in bulk in its railway traffic and this gives a basic unity to the whole, since, with the lack of coal and water-power, brown coal—in the form of briquettes or of electricity—is almost the sole source of domestic fuel and of power for industry. Finally, the largest cities dominate local circulations, economy and organization. These cities are Leipzig, Dresden, Chemnitz, Magdeburg, Halle, Erfurt and Plauen. Leipzig is the focal city, the greatest in size, and the chief commercial and cultural centre.

Central Germany produced (pre-war) a half of the production of brown coal in Germany (Thuringia-Saxony, 35 per cent, Upper Lusatia, 5 per cent, Brunswick-Magdeburg, 5 per cent), whereas Lower Lusatia supplied about a fifth, and the Lower Rhineland (west of Cologne) a third. Brown-coal deposits underlie the rich agricultural plains and are known to form a north-south oval-shaped area, with Leipzig at its centre, extending forty kilometres from east to west through Leipzig, and seventy to eighty kilometres from north to south. A second area, a long narrow belt, running northwest to southeast to the north of the Harz, has its chief centre of production in Helmstedt. Production is localized in several separate districts which overlap into all of the main administrative divisions in the region. The chief seats of production are in the heart of the region.

Coal production is limited to the state of Saxony at Zwickau, Lugau-Ölsnitz and Freital. They produce the small amount of 4 million tons per year.

Brown coal, amounting to nearly half of Germany's pre-war production (three-quarters if Lower Lusatia be included), is the bulkiest commodity in the traffic of the area. It makes up a quarter (about one-third with coal) of the traffic of Merseburg-Erfurt, and about a third (40 per cent with coal) in each of Thuringia, Saxony and Leipzig.¹

As regards receipts and dispatches for each district for both coal and

¹ These are the five traffic districts used for railway returns (*Verkehrsbezirke*). They are *Regierungsbezirk* Magdeburg and *Frei Staat* Anhalt, *Regierungsbezirk* Merseburg and R. B. Erfurt, F. S. Thuringia, F. S. Saxony, and Leipzig and district. For details on brown coal trade, see H. Thormann and F. Staab, *Der Mitteldeutsche Raum*, 1929, p. 75.

lignite, central Germany, considered as the five traffic provinces, is a closed province to the extent of 70 per cent of its trade. The percentage of all rail traffic of each district with the other four districts in central Germany was in good normal years: Magdeburg-Anhalt 40, Merseburg-Erfurt 50, Thuringia 60, Saxony 50 and Leipzig 75. Thus, a half of the total traffic of these five districts was with each other, and the other half with the rest of Germany.

These districts, with the exception of Leipzig, are large and their size obscures the orientation of some of their area to neighbouring districts. In this respect, attention is drawn to the relatively densely peopled industrial districts, in which Mitteldeutschland tapers out to northwest, southeast and southwest. The lowland north of the Harz, in so far as it is oriented towards Magdeburg and is a lignite-producing area (around Helmstedt), may be included in Mitteldeutschland. This would seem to be supported by both features of relief and natural vegetation as well as by the industry and agriculture of today. Nevertheless, this area has close ties with Brunswick, and includes detached sections of that state, and has considerable trade with Niedersachsen (Hanover). All writers and proposals are agreed that Brunswick itself should be excluded from Mitteldeutschland. The Hof cotton-manufacturing district, lying on the south side of the Thüringer Wald, is closely allied with both Mitteldeutschland and north Bavaria. The Görlitz (in Silesia) and Zittau (in Saxony) districts in Upper Lusatia are similarly transitional to Silesia, though beyond them there is a definite break in the density of population and industrial intensity. Lower Lusatia, though a lignite and textile industrial area, is closely allied functionally with Brandenburg and Berlin, so that the Brandenburg frontier may be taken as the boundary against central Germany.

The Elbe is the only deep, navigable river, and it borders the whole of the northern and eastern margin of the area. It is now continued with the Mittelland canal, which joins the Elbe at Burg, a few miles below Magdeburg. There are no other waterways of any importance south of this route, and break-of-bulk points on the Elbe are fed by road and rail. The Saale alone is navigable by small barges to some miles above Naumburg (200 tons) and barges of 1,000 tons can now go as far as Trotha, below Halle¹ (Fig. 40).

Magdeburg is the great river port for northern Mitteldeutschland, but, as noted above, there are several small towns east of it, on the south bank of the river, which are important transshipment points for goods coming up and down the Elbe and they are also, in consequence, seats of heavy industry (Schönebeck, Barby, Dessau).

¹ Canals are planned to link Gera and Leuna to Leipzig and Torgau and the Saale is to be canalized to link Merseburg (Leuna) with the Mittelland canal. The building of the barrage on the Saale will also regularize the flow of water.

There is a high density of traffic and of routes per unit of area in the middle Elbe basin. In general, this reflects, as we might expect, the distribution of population, and the radial arrangement of local routes brings out clearly the location of the spheres of influence of the small country towns, especially in Thuringia. Most remarkable is the very high density of routes, and the heavy traffic on them, in the whole of the Erzgebirge in Saxony from Upper Lusatia to Plauen and Hof at the western end. This broad zone passes, by a gradually wider spacing of density lines, into the Halle-Leipzig Bay, although the close network of routes remains a main feature. The band narrows north from the Saxony base to Magdeburg and to the country on the northern slopes of the Harz westwards to Brunswick, and then continues, without a break, to Hanover. The density of the route net and of traffic decreases abruptly to the north beyond Magdeburg and the Elbe. Thuringia has a distinct pattern with its equally spaced old towns, each with a radial road net, and there are many short local routes feeding the industrialized Thuringian highlands. Erfurt is the dominant centre.

A pre-war study of all categories of traffic circulations calculated on a density basis for twenty-nine districts reveals some interesting facts about Central Germany.¹ Five districts correspond with this area. The high density in the state of Saxony and the south of the province of Saxony is due to the density of the railway net in these very populous areas. But the upland areas around this core have a highly developed road net as well as a close railway net, for they too are densely populated industrial areas with high traffic "potentials". This applies to the Harz, Thüringerwald, Frankenwald, the Fichtelgebirge and Erzgebirge. Here road services make up for the inadequacy of railway facilities. Thus, according to this authority, the "Thüringerwald, Frankenwald, Fichtelgebirge" district, which combines both a close railway and road net, exceeds the rest of central Germany in its traffic density, and stands third only in the Reich after the Ruhr and the Cologne Bay. The Harz also has a higher density than the Thuringian lowland. But these conclusions are based on the density of routes. The density of the traffic using them reveals that the greatest intensity of traffic is in the state of Saxony and the south of the province of Saxony, that is, in the great urban and industrial areas.

The middle Elbe basin is treated as a unit, and described as *Mitteldeutschland*, for many purposes in the life and organization of its people. It has figured, with variations, in the numerous nation-wide divisions of the Reich and in regional associations, and innumerable proposals by both public authorities and private investigators have been put forward for

¹ H. Ende, "Die Verkehrsdichte des Deutschen Reiches", *Archiv. für Eisenbahnwesen*, Hefte 3 and 4, 1936.

the recognition of this *de facto* "natural" or homogeneous geographical unit, inherent in the structure of modern society, as a *de jure* political unit. It is of interest to note, in conclusion, that in all these definitions, the Leipzig-Halle area figures consistently as the heartland. The border areas with divided allegiance are Hof in the Fichtelgebirge in northern Bavaria and Görlitz in Upper Lusatia in the southwest and southeast corners of the area respectively, and the Magdeburg area in the north. The last is in many ways a distinct area, and the thinly peopled heathland just north of Magdeburg in the Altmark is almost unanimously excluded from central Germany. But though the focal point of a distinct closely settled area north of the Harz, Magdeburg itself as a great river port and industrial centre serves the Saxony-Anhalt industrial and agricultural area, it has close relations with Berlin and Hanover, and it is equidistant from these two and from Leipzig-Halle and Hamburg. Thus, the Magdeburg area is a transition area between the important regional nuclei around it. The same sort of transitional character is found in Lower Lusatia, which, as a new industrial area, is allied to both the central German region in its brown-coal interests, and to Berlin in the marketing of its products and its administrative organization.

This whole area today falls into the Soviet Zone of Occupation and is organized in three new Länder-Sachsen-Anhalt, Thüringen, and Sachsen. It has experienced great changes during and since the war, which, however, it is not yet possible thoroughly to evaluate. Such changes, however, are taking place on the background of the permanent geographic framework that we have portrayed in this chapter.

CHAPTER 26

BRANDENBURG AND BERLIN

GENERAL

THE PROVINCE of Brandenburg covers the northeast of the Northern Lowland. It has its historical nucleus in the zone of the great valleys and low diluvial platforms between the Elbe and the Oder, but extends to the north and south to include parts of the Baltic and Fläming morainic uplands. The general features of the relief of these areas have already been described (pp. 29-36).

The physical units shown in Fig. 13 (pp. 82, 83) reveal a central core of the Middle Mark Lowland (*Platte*) and the Havelland Lowland (*Platte*). This core is bounded by the river plains of the Elbe and the Oder to west and east, and by the Uckermark Heath to the north and the Fläming Heath to the south.

Five types of relief are developed on the glacial deposits (Fig. 4, pp. 24, 25). These are as follows: Areas of smooth low-lying relief are located on the low platforms, such as the Barnim platform immediately north of Berlin. This gently undulating land was cut by the shallow channels of the melt-waters, that are now occupied by sluggish streams, patches of marsh and bog, and considerable depths of clay and sandy loam, laid down by the melt-waters to depths of three metres. Ground moraine areas are well developed on the Baltic ridges, and characterized by an irregular hummocky or hilly relief with many lakes, intermingled with marsh and bog, and with a bewildering network of winding valleys occupied by streams that lose themselves unexpectedly. Here, too, there are numerous erratic blocks that figure so frequently in the building of church and village and field walls. To these types of country are to be added the morainic uplands of the Lüneburg and Fläming heaths. Cutting across the whole lowland are the great flat valley floors of the abandoned glacial troughs. There are three of these: the Eberswalde-Havelberg trough on the south of the Baltic Uplands; the central trough occupied by the lower Havel and the Spree, with various branches; and the southern Glogau-Baruth trough at the northern edge of the Fläming Uplands.

THE GROWTH OF BRANDENBURG

The province of Brandenburg is a well-defined politico-cultural unit (Fig. 55, pp. 330, 331). The Altmark, founded west of the Elbe in the early

phase of German expansion in the tenth century, was first known as the Nordmark and its first German settlements were built as strongholds, such as Stendal, Salzwedel and Tangermünde. It was an outpost of the kings of Saxony, who were also Emperors of Germany, for the defence of the eastern frontiers and for the spread of Christianity among the Slavs. For this purpose, bishoprics were early established at Havelberg (946) and Brandenburg (949). But the foothold was an insecure one and did not become firmly established until the early twelfth century. The Nordmark then became known as the Altmark to distinguish it from the new territories that were founded to the east. Beyond the Elbe, east as far as the Oder, the middle mark—Mittelmark—was established at this time by Albert the Bear, who acceded to the Ascanian line in 1133. At the same time the districts of Priegnitz, Uckermark and Ruppín were added to the Nordmark and the whole became the margravate of Brandenburg in 1157. At the end of the fourteenth century the Neumark was established east of the Oder as another outpost against the Slavs of Pomerania. Though Brandenburg became an electorate of the Empire in 1351, it was thinly peopled and encircled by dominantly Slav dukedoms. The capital remained in the west at Tangermünde, and Berlin did not become a town until the mid-thirteenth century, and Frankfurt further east on the Oder was established as a military base for the conquest of the Neumark. The elector of Brandenburg pawned the province of Neumark to the Teutonic Knights, but in 1411 the Hohenzollerns came to the electorate. They immediately strengthened their hold over the province and bought back the Neumark and established Berlin as the capital in place of Brandenburg. Thus, the core of the Prussian state was firmly established. Lower Lusatia to the south was not added until 1815. Our concern here is with these historic units and their subdivisions as permanent politico-cultural units.

TERRAINS OF THE MIDDLE MARK LOWLAND (Sheet 8, Fig. 104)

The *Mittelmark* lies between Elbe and Oder and the Fläming and Baltic uplands. It falls into three main zones separated by the main west-east valleys, and north-south valleys split it up into still smaller sections. In the midst of this variegated landscape pattern lies the great urban complex of Berlin. These divisions are shown in Fig. 104. In the north the Baltic Uplands slope gradually southwards, over a distance of ten to twenty miles to the Eberswalde-Havelberg trough, and the Havel flowing south to the latter separates the Priegnitz from the Ruppiner Land and the Uckermark. In the central zone the Havel trough from Havelberg and Burg on the Elbe to Furstenwald breaks up the diluvial platform of Barnim and Lebusland from the low-lying plains of the Havelland.

The southern zone is broken into sections by streams that flow north from the Fläming Upland and cross the Baruth trough. In the east beyond the Neisse, the Gubenerland, the *Hochfläche* dominates. West of the Spree valley, sands and bog dominate (Beeskow-Storkowerland and Teltowland), and in the west the Zauche is a clearly defined platform.

The spread of medieval German colonization took place from west to east. The main routeway ran from Magdeburg, south of the Haveland marshes to the Spree crossing at Berlin, and then crossed the Barnim diluvial plateau to the Oder. On this route lie the chief historic towns of Brandenburg, Potsdam, Berlin, Frankfurt and Küstrin. Towns in the zones to the north and south did not attain the same importance. As the Mark became central to the lands of Prussia, so Berlin emerged as a great route focus, and under the modern conditions of transport, together with the growth of industry, selected towns have grown apace—Wittenberg, Kottbus and Luckenwalde—while towns off the main radial railway routes have vegetated and maintained their medieval aspect.

The *Zauche* in the west of the southern zone is surrounded by marshes, and since it lay on the southern edge of the Ice Sheet we here find a northern platform of sandy loam soils, merging northwards into the Havel trough, and very infertile *Sandr* in the south, that give to the area its name, *Zaushe*, meaning dry. Between these two lies the terminal moraine. Thus, only the northern sector is suitable for arable cultivation, while the south is covered with pine forest. Slav village names dominate on the edges of the Zauche and German in the centre, where settlement was due mainly to the efforts of the Cistercian monks. On the border of the *Sandr* to the south there are Slav *Rundling* villages as well as German Cistercian foundations, and later colonies established in the eighteenth century by Frederick the Great. In the north there are many brickworks and a navigable chain of lakes permits exports to the Havel. Orchard-farming spreads on the sandy slopes of the Havel trough (Werder) to serve Berlin. But the plateau itself is isolated and roads and rail run along its borders, and the chief urban foci lie in the lowlands around it—Potsdam, Brandenburg, Belzig.

The *Teltowland* lies south of Berlin, and its triangular base is on the Baruth depression. In the north it is a boulder-clay plateau (*Platte*), whereas in the south it includes a part of the sandy and bog-covered depression. Nevertheless it forms a human unit and corresponds closely to the *Kreis* of Teltow. This unity is due to its location. To the south the Baruth depression is narrow and filled with sands and dry, so that it is more easily accessible from the south than its neighbours. On its northern edge is the crossing over the Spree that marked the site of Berlin. Thus, railways from Saxony and Silesia concentrate in this area. It is bordered to the north by a lake-filled depression, to the west by the

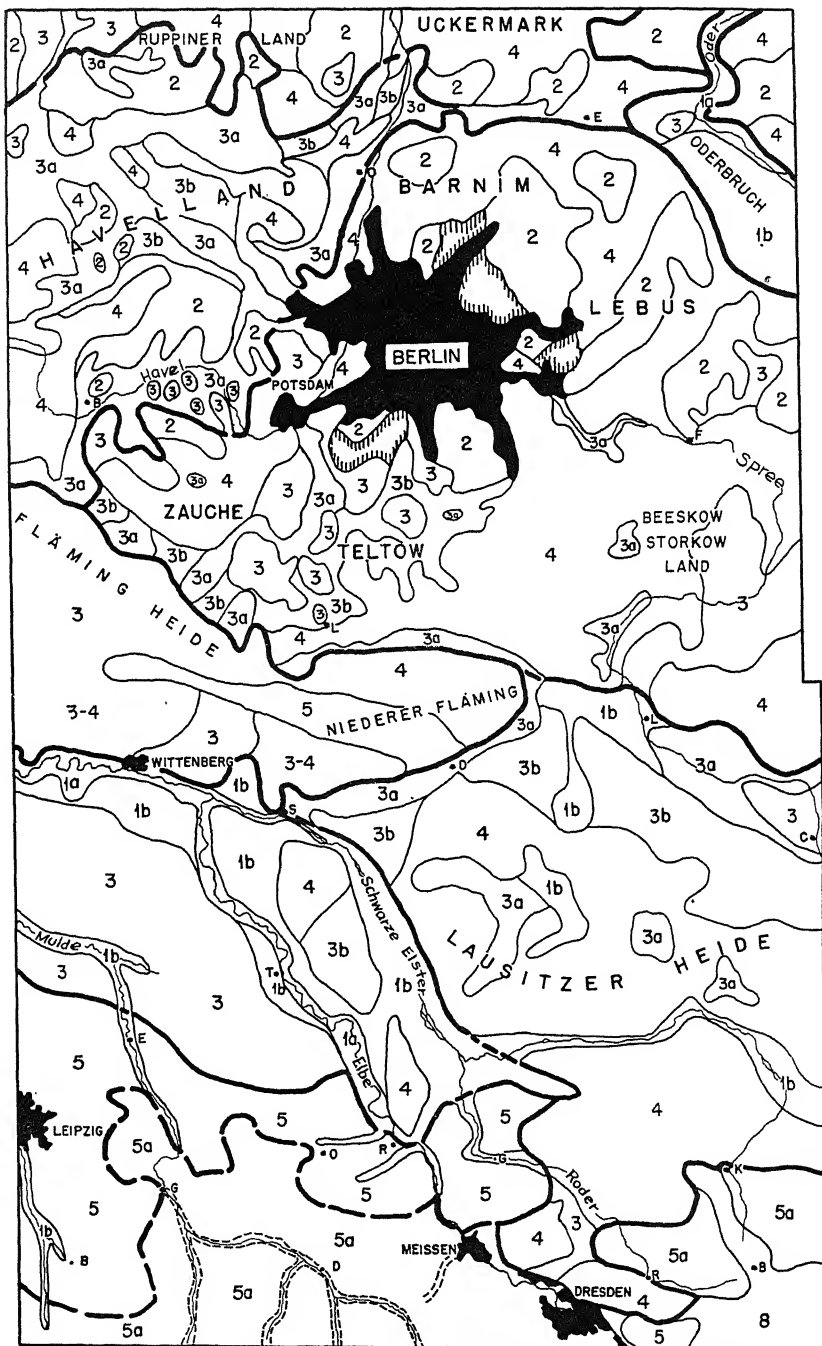


FIG. 104—TERRAINS AND REGIONS: Sheet 8. BRANDENBURG AND BERLIN
 [Continued on next page]

Spandau-Potsdam stretch of the Havel, to the east by the lakes of the Dahme and Spree. On its northern edge, the hill of the Kreuzberg overlooks the city of Berlin. Along the Havel lies the forest of the Grünewald on hummocky land, with partly filled kettles and shallow lakes in all stages of infilling. Steep cliffs drop to the Havel. Most of the area is gently undulating, fertile, arable countryside with loam soils, that have been largely deforested and occupied by compact nucleated villages, all of which bear German names derived from their medieval settlers. To the south, there is a lowland trough in which lie several lakes, and isolated raised islands of sand and gravel. The strategic crossings of this depression are commanded by small bridge-towns such as Trebbin, Zossen and Mittenwalde. Towards the Baruth depression the damp lowland disappears and sands become dominant; this country is forested and thinly peopled, and its only town is Luckenwalde (29,000) which grew from a village in the nineteenth century through the growth of industry and administration following on its choice as a *Kreis* capital. The urban influences of Berlin are evident in the form of market gardening and military training grounds on the heaths to the south.

The Teltow plateau is bordered to the east by the depression of the Oberspree and beyond this there appears another plateau area, the *Beeskow-Storkowerland*. The latter embraces the plateau and the former the lowland. Between the Spree and the Dahme lies a mixture of lakes and marshes embedded in fluvio-glacial sandy deposits. Remnants of a moraine rise above the sands and spread also on to the Beeskow platform reaching a height of 148 metres on its northern borders. To the south of this morainic ridge lies the Scharmützelsee, a great *Rinnensee*. Thus, with the exception of the boulder clay platform of Beeskow, the land is thickly wooded and thinly settled, and its density of population is the

Fig. 104. This area includes from north to south the greater part of Brandenburg in the Northern Lowland; the zone of heath-covered morainic uplands; the great trough of the Elbe; and a portion of the Saxon Bay.

1a. *Alluvial Plains*. River flood-plains. Marsh, streams, meadow and damp woods.

1b. *Low-lying Plains with Clay or Loam soils*. Mainly cultivated (meadow), closely settled, linear villages, much drainage and reclamation (note Oder *Bruch*).

2. *Undulating Upland*. Loam soils. Open arable land, compact villages on diluvial platforms, often bounded by sharp scarplets.

3. *Sands and Gravels: Upland Geest*. Mixture of heath, wood and arable. Usually well drained.

3a. *Sands and Gravels: Low-lying Plains: Moor* (40 m. or under). Bog (*Bruch*).

3b. *Sands and Gravels: Reclaimed Bog*. Woodland and arable with some settlement.

4. *Sands and Gravels: Forested*. Plain or Upland. Hummocky, sand dunes on the upland; and low-lying forested sands to the east and southeast of Berlin.

5. *Undulating Loess-loam Land*. Dominantly arable with compact villages.

Note. Urban areas are shown in black. The hatched areas around Berlin are *Rieselfelder*—areas that are fertilized with liquid sewage waste.

lowest in the Mark. Moreover, it lies off the main routeways and has no towns, for Beeskow and Fürstenwalde lie on its margins, the latter having grown as a seat of industry.

The *Gubenerland* lies east of the Spree valley between the Neisse and the Bober, and is bordered to the north and west by wide valleys. To the south, the Baruth depression is dry and sandy, so that the way to the south is easy, a fact that is revealed by its historic allegiance with Lusatia. The plateau is covered by boulder clays and moraine and sands, so that it is thickly wooded and thinly peopled and isolated. In addition to the industrial towns of Lusatia to the south, Guben (44/25) on the Neisse is its chief town, a seat of textile industries (hats) and the seat of the fruit-growing of Niederlausitz.

The *Havelland* lies in the depression followed by the Havel. This is bordered north by the Eberswalde trough occupied by the Rhin Luch and the Ruppiner canal, and south by the Havel and the lakes along its course. This is very much broken up, for most of the area is flat and low-lying, though it contains a number of small raised "island" platforms with light or better drained soils. In the north the platform is more continuous, and here are several distinct geographical districts (German *Ländchen*)—Rhinow, Friesack, Bellin and Glin. In the main east-west trough between Potsdam and Brandenburg the islands are very small, like small steep-sided, flat-topped blocks rising above the plains. The plains are called *Luche* and *Brücher* (such as the Rhin and Havelland) and have an average altitude of thirty to thirty-five metres, with the higher platforms at levels of some fifty metres. A few morainic remnants reach greater heights of about one hundred metres. To the west the plains become wider and are covered with deposits of sands as far as the Elbe, where the plains end in the Fiener Bruch in the south and the marsh of the Lenzer Wische in the north. These plains were originally peat bogs and swamp land and subject to extensive flooding in the spring, and they were only available for use as pasture during the summer months. But during the eighteenth century a main canal, seventy kilometres long, and numerous ditches were dug in the Havelland Luch (1782-5) and the Rhinluch was drained by the Rhin-Kanal (1776). The Plauer Kanal, originally built as a navigable channel, was opened in 1745 and served for the drainage of the Fiener Bruch (1774-7) in the following years. Thus, there took place the drainage, the removal of peat and the cultivation of the bogs, with the emphasis on cattle raising, on the Dutch plan (*Fehnkolonien*). The meadows and extensive peat-cutting operations that still go on in parts of this area are reminiscent of northwest Germany and eastern Holland.

The towns of Spandau and Rathenow lie at the crossings of the north-south stretches of the Havel with the main west-east routeway that links

the Altmark and the Mark, and is today followed by the main railway. These are the only two towns in the area that have grown in modern times. Spandau (170,000) was fortified during the Thirty Years War as a defence for Berlin, and defortified in 1870. It developed as a seat of military industries, and it is today joined up with the capital city. Rathenow (33,500) is the seat of a small optical instruments industry.

Havelberg, in the northwest, lay on the high banks of the Havel, well protected on an island-like site. It was chosen as a seat of German eastward colonization and Christianity in the tenth century. Other towns lie at convenient crossings of the low bog land, though with the transformation of the latter they have little modern importance, especially when they lie off the modern roads and railways.

The diluvial platform of *Barnim and Lebus* lie north of Berlin, between the Havel valley to the west, the arc-like curve of the Eberswalde trough to the north, and by the edge of the Oder trough to the east. Southwards, it is bordered by the Spree trough. In its higher eastern half a morainic ridge rises above the platform, with a hummocky relief of 130 to 160 metres and many small lakes. On the platform south of these moraines, there are glacio-fluvial sands and eskers, that drain southwards to the Spree; while nearer to Berlin, between Bernau and Altlandsberg, there is a smooth-surfaced boulder clay platform. The morainic hills are deeply dissected by short deep valleys on the edge of the Oder trough. Similar features are found on the edge of the wooded trough between the Oder and the Spree that separates the Barnim and Lebus districts. This rough topography bears the name of the *Märkische Schweiz*.

The German names of the villages on this boulder clay plateau point to medieval settlement, but near Berlin there are foundations of the eighteenth century and suburban growth has spread on the margins of the city. Many small towns lie along the roads that radiated from the Spree crossing at Berlin, and along the edges of the Thorn-Eberswalde trough. The Spree valley has only one town in Fürstenwalde. Most of them lie off the railways that follow different courses from the old roads to Eberswalde, Küstrin and Frankfurt. Frankfurt (69/51), situated at a narrow crossing of the Oder trough above the *Bruch*, has long been the chief city of this area as a focus of road and rail and river traffic at a bridge crossing, and an ecclesiastical centre and the site of a university from 1506 to 1811. Its modern growth has been impeded through its proximity to Berlin, but it has acquired a variety of industries and is an administrative centre for a *Bezirk* as well as a garrison town. Eberswalde (34/31) lies on the Finow canal and the more modern steamship canal.

The northern zone of the Mark comprises the southern slope of the

Baltic Uplands. It contains two parallel terminal moraines that trend in a southeasterly direction. The Priegnitz in the west is a smooth-surfaced diluvial platform lacking in hills and lakes, though its soils include both loams and sands. The Ruppiner Land, its easterly continuation, between the Dosse and Havel, has a southward curving arc of older moraines. The Uckermark has a hummocky relief developed on the ground moraine as well as sands (*Sandr*) that are forested or heath-covered. The end moraine becomes very marked further east.

The boulder loams of the Uckermark are the best wheat lands in the Mark. Only the southwest and the greater part of Ruppiner Land are sandy (*Sandr*). As in Mecklenburg, large holdings and estates are common. Routes cross the eastern section, but avoid the western (Priegnitz) section, whose towns of medieval origin remain small today. Wittenberg (28,000) is a road and rail centre and an Elbe river port. Neuruppin (17,000) was the capital of the old county (*Grafschaft*) of Ruppiner Land and lies on rail and river.

THE FLÄMING (Fig. 104, p. 648)

The Fläming extends from Elbe below Magdeburg and merges at the eastern end in the Lausitzer Höhen and the Katzengebirge. It is bordered to the south by the great glacial trough that is occupied by the Elbe, the Schwarze Elster and the slight east-west courses of the south-north flowing valleys, eastwards to the east-west bend of the Oder below Breslau. The northern border is formed by the smaller trough of the Glogau-Baruth. It is a continuation of the Lüneburg Heath and is the most southerly of the great belt of moraines. There is an important distinction between the western Hohe Fläming and the eastern Niedere Fläming, east of Jüterbog. The Hohe Fläming has large areas averaging 150 metres in altitude, whereas the Niedere Fläming has few parts that reach this altitude. The Hohe Fläming has a hummocky relief and a steep drop to the north, whereas the eastern sector has a flatter relief. The upland as a whole rises slowly from south and west, and drops steeply to the north. This is due in part to the erosion of the tributaries of the Elbe that drain the southwest slopes, whereas there are very few streams on the north slope, which is thus steep and undissected. The Fläming carries the most southerly terminal moraine, and is covered in the south with old and in the north with more recent diluvium, and the centre is taken up by a varied glacial deposits. There is thus a marked belting of terrains from northwest to southeast. The old diluvium to the south is mostly boulder clay. Then follows the zone of sands and moraines in the Hohe Fläming. A strip of loess-like sands border the northern edge of the Fläming from Belzig to Jüterbog. The northern part

contains great depths of sand and gravels, but Tertiary clays often lie near the surface in the southern section.¹

The geological contrasts on either side of the moraine are reflected in the surface features. The southern zone is a smooth-surfaced plain of the Old Drift and is a last extension of the Saxony or Leipzig bay (see Fig. 81). Its soils are black earths and are continuous with those of the Magdeburg *Börde*. Behind the end moraine in the Hohe Fläming the surface is that of a more recent diluvial platform with an undulating surface, and though the glacial lakes are here absent, there is a number of bog-filled basins and *Sölle*. The southern sector has impermeable soils with many streams, whereas the northern sector, beginning with the moraine of the Hohe Fläming, has very pervious sands, lacking in surface water, and the water table is very low. Many villages have only recently been assured of an adequate water-supply by deep wells, with wind-driven pumps. The edge of the upland is deeply gullied though the gullies are only occupied by water after heavy rain or when the snows melt. Drainage reaches the Baruth trough, and the streams have large alluvial fans where they enter the trough. These fans stand out as well-drained islands clearly distinguished from the marsh of the trough.

The original woodland vegetation of the Hohe Fläming remains in the central zone of the moraines and sands (*Sandr*, *Brandtsheide*) and in patches on poor boulder clay. Heath and open spaces of gnarled and bushlike pines are probably also characteristic of the primitive vegetation. The loess zone was probably free of forest, while the marshy troughs to the north and south still contain remnants of deciduous trees, alder-bush and bog in contrast to the *Heide* of the upland.

The southern slopes early attracted settlement, whereas the poor soils and lack of water of the northern slopes were deterrents to settlement. The latter was long avoided and formed the boundary zone of neighbouring Slav *Gäue* and also caused a forking of the eastward movement of German medieval colonization to north and south. It formed a boundary in other respects, as between Upper and Low German dialects, and as the southern limit of the Lower Saxon house types. It was also a political divide between the archbishopric of Magdeburg and the Mark, and the Ascanian and Meissner lands, and later between Anhalt, Saxony and Prussia. Slav settlement was confined to the southern zone and a northern terrace (*Belzig*), and forest clearance was undertaken in the later Middle Ages from Magdeburg and Dessau. Many attempts at settlement in the forest in the Hohe Fläming failed, as is revealed by clearings without settlements and church ruins in the forest.

The zonal arrangement of the Fläming is reflected in its economy.

¹ There are terminal moraines of the ice front of the second (Warthe) and final (Vistula) glaciations in the Fläming-Lusatian Uplands.

The southern zone from Magdeburg to Zerbst is an arable zone, in which the growth of sugar beet links it with the *Börde*. East of Zerbst the *Sandr* reaches south to the Elbe and the country is forested with many clearings. Forest is dominant in the sands and gravels of the central morainic zone and the small villages have distinctive features from the south, for farming is inadequate as a livelihood, and there is dependence on the woods, the exploitation of which has been controlled by the large estate owners since the eighteenth century. Settlements cluster around saw mills and foresters' houses and woodworkers' homes. Northwards, the woodland opens out, and agriculture becomes more important, but villages are small and farmsteads modest in size, for this is an area of poor sandy soils and large estates. On the other hand, in the Belzig loess-strip there are good-sized peasant holdings and large farms in compact villages, and here there are few large estates (Fig. 104).

The problem of water supply set the limits to the Slav settlement. German settlers sunk wells. But to this day the lack of surface water is reflected in the poverty of meadows, and the villages still draw hay from the meadows of the Baruth trough that is carried along tracks called *Heywege*. Windmills are a feature of the Hohe Fläming, whereas water-driven mills occur in the Belzig platform. A series of flourishing little towns lie along the southern border of the Fläming and along the Elbe valley. They began as fortresses in the first era of German colonization and lie along an old highway that interlinks Magdeburg and Dessau. Zerbst (19,000) and Wittenberg (28,000) are its *Perlen alter Stadtkultur*. But there are few towns on the northern border: old fortresses failed to attract urban centres. The old land routes ran on the western border of the Fläming on the Elbe (Burg-Magdeburg) and on the eastern side to Wittenberg. It was not until modern times that the railway route Berlin-Güsten crossed the upland, and brought it out of its isolation. An autobahn now follows the same course.

LOWER LUSATIA (Fig. 104)

This zone stretches east of the valley of the Dahme in continuation of the Fläming and reaches east to the south-north course of the Bober. The main morainic upland, the Lausitzer Höhen, is bordered to south and north by the easterly continuations of the Magdeburg-Breslau and Glogau-Baruth troughs. The upland became the political boundary between Brandenburg and Silesia in 1815, but historically it is a unit. Niederlausitz was closely associated with Oberlausitz to the south in the foreland of the Sudetes, with its capital in Görlitz. The troughs here are somewhat obscured by fillings with detrital deposits and sand dunes between the Neisse and the Bober, so that the area is less clearly defined by

physical limits than the Fläming, especially as the belt is cut by the valleys of the Spree, Neisse and Bober. Tertiary beds, containing lignites, underly the glacial deposits, and outliers of the old granite massif in Upper Lusatia outcrop here and there as isolated hills.

Poor, pervious soils as characteristic glacial soils are dominant—boulder clays, sands (*Sandr* and valley sands and dunes) and detrital fans. The whole has a cover of pine woods and heath, with patches of bog (see Fig. 104).

The zone was long devoid of settlement and long remained a barrier. Roads and towns skirted it to north and south and it is only in recent years through the growth of industries that settlement has spread to the interior upland. The old politico-cultural boundary between Saxon Oberlausitz and Silesia to the south and Brandenburg to the north, is evident in the *Land* and *Provinz* boundaries of today. This is the central wooded belt.

The eastern part, in Lower Silesia, was brought into the sphere of German settlement first, whereas a thin veneer of Slav settlement remained undisturbed in the western part, and the speech and customs of the Wends are preserved in this area today. The thicker forests in its centre have acted as a barrier of dialects, religions and political affinities between the Catholic Wends of Oberlausitz in Saxony and the Protestant folk of Niederlausitz who live in Prussian territory.

Modern roads and railways and the development of industry have opened up the region to settlement. The growth of industrial settlement attracted the Wends to the towns where they have been almost completely absorbed. There is little farming in this poverty-stricken heath and woodland. Fishing is carried on in the many small ponds that are partly natural and partly artificial. The woods were formerly used for bee raising and timber felling, but there are now considerable plantations of mixed stands. The open quarrying of brown coal has destroyed large areas of forest land, and the gigantic quarries caused a lowering of the water table and landslips.

The brown coal is used for the manufacture of briquettes, and the old glass industry, that formerly depended on sands and charcoal, is now supported on a large scale by the brown coal fuel. The chief centre is Weisswasser (11,000). Tertiary clays also form the basis for a ceramics industry. Brown coal is also used in the generation of electricity, for aluminium smelting, and there are also great electricity generating plants. The forest is the raw material basis for the production of pit-props, paper and furniture.

The Baruth valley is also well wooded and between Kottbus and Lübben is the great marshy forest of the Oberspreewald. Forest clearance and drainage of the bogs along the Spree through the construction of

dikes, ditches and embankments have brought much of the land under field and meadow. Frederick the Great was especially responsible for this work of reclamation. Many isolated farms and villages, situated in these marshy woodlands, are only accessible in flat-bottomed boats in summer and on skis in winter. The block houses show features of Wendish customs. Vegetables are grown on fertile alluvial soils and the products are sold in Lübbenau. Cottbus (53/49), situated at a crossing of the Spree, is a chief bridge point and road focus, and with Spremberg (11,000) and Forst (45/29) is a centre of the textile industries.

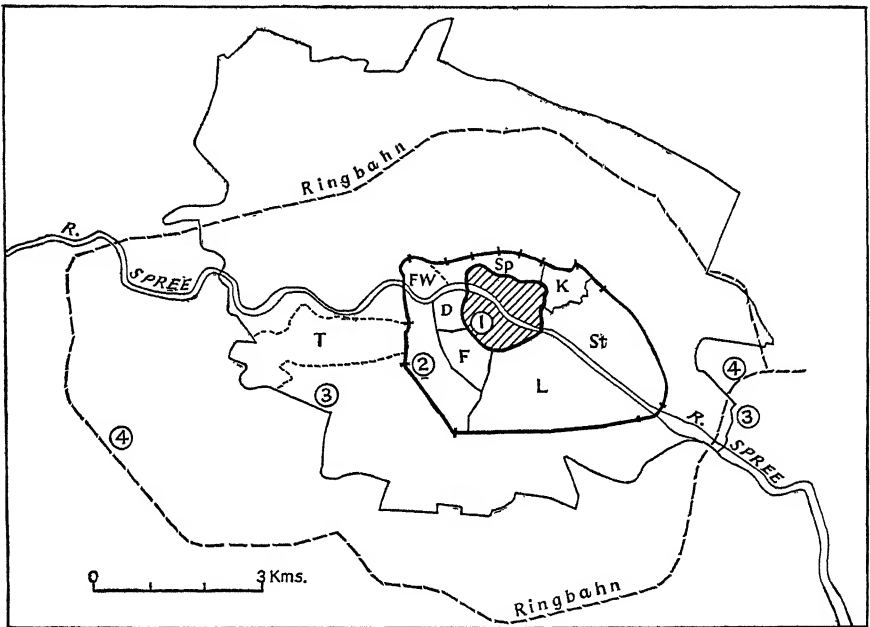


FIG. 105—THE GROWTH OF BERLIN (from Leyden) (scale, c. 1 : 125,000)

1. Old town at end of 17th century (*Kurfürstenstadt*), including Berlin and Kölln, Friedrichswerder (1662) and Neu-Kölln (1690).

2. The customs wall (*zollmauer*) and its gates, enclosing Dorotheenstadt (D) (1674); Friedrichstadt (F) (1691); additions after 1738, are Luisenstadt (L), Strahlauer Viertel (St.), Königsviertel (K), Spandauer Viertel (Sp.), Friedrich-Wilhelmstadt (FW).

3 is the boundary of Berlin until 1920.

4 is the circular railway (*Ringbahn*).

T is the *Tiergarten*.

BERLIN (Fig. 107)

Greater Berlin was formed in 1920 by the combination of the *Altstadt* of Berlin or Old Berlin with ninety-three surrounding *Gemeinde* or parishes. It has an area of about 890 sq. km. and had a population in

1920 of 3·8 millions, in 1939 of 4½ millions. In 1946 the population was 3·2 millions. The river Spree crosses the city from east-southeast to west-northwest, the Havel, joining the Spree at right angles at Spandau, and the Dahme at Köpenik, form its approximate east and west borders, and both areas are marked by belts of lakes. Midway in its course between Köpenik and Spandau the Spree branches, and on the enclosed island was sited the original medieval town of Kölln, and on the north

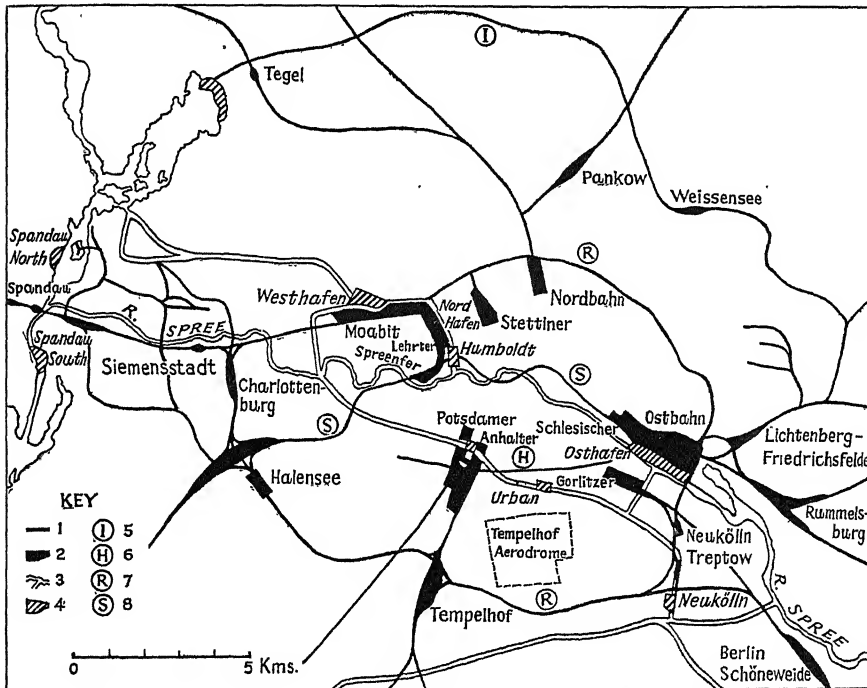


FIG. 106—COMMUNICATIONS IN BERLIN (scale, 1 : 200,000)

- | | |
|-------------------------------|-------------------------------------|
| 1. Industrial railway | 5. Outer industrial belt line |
| 2. Goods yards | 6. Hochbahn |
| 3. Navigable river and canals | 7. Ring railway (<i>Ringbahn</i>) |
| 4. Harbours | 8. <i>Stadtbahn</i> |

bank of the river, Berlin. These two together, with an area of about 175 acres, were endowed with town law in 1240 and 1237 respectively, and formed the *Altstadt* of Berlin. Fortifications with bastions in the French style were built in the seventeenth century and enclosed both Berlin and Kölln as well as Friedrichswerder, which was founded in 1662. The addition of the Dorotheenstadt and the Friedrichstadt as court districts by the kings of Prussia was accompanied by the layout of the Tiergarten. These five settlements covered 6¼ sq. km. and had 57,000 inhabitants in the first years of the eighteenth century. In 1737 the *Zollmauer* or Customs Wall

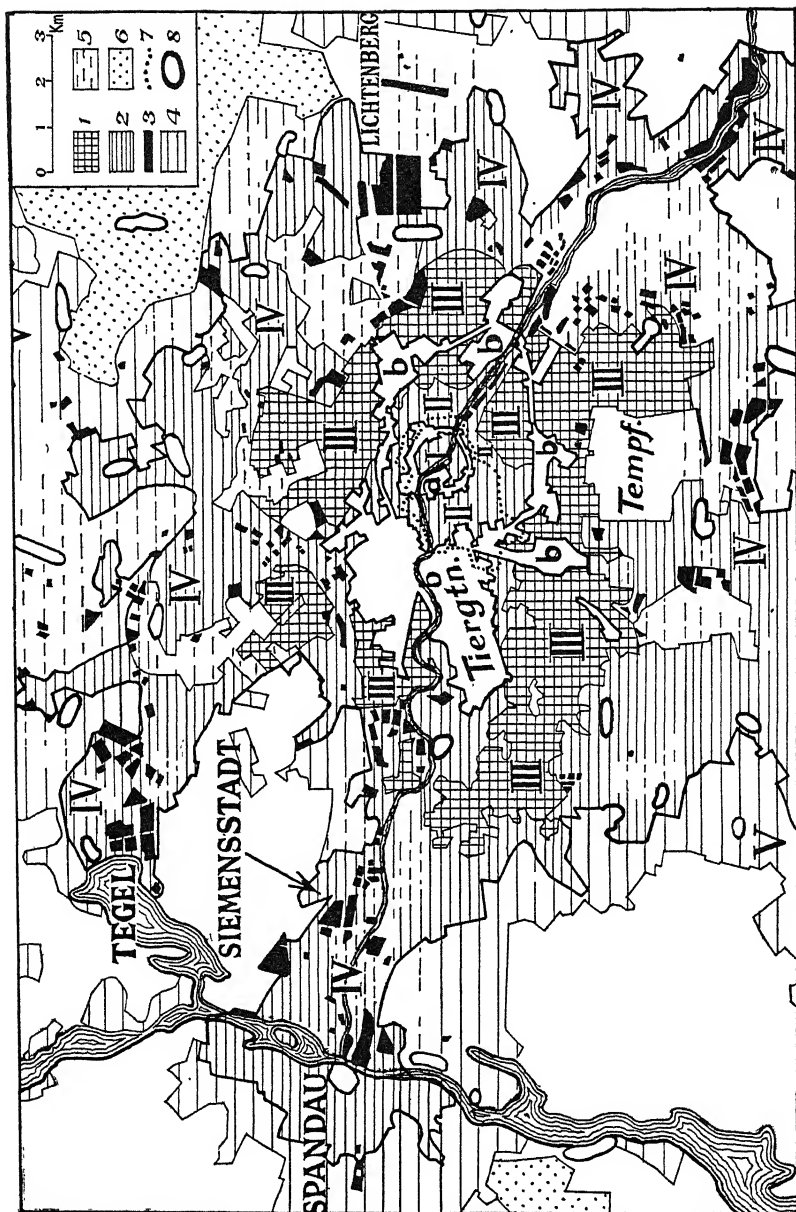


FIG. 107—THE BUILD OF BERLIN IN 1937 (from Louis) (scale, 1 : 200,000)

[For key see next page]

was erected. This was a palisade intended as a fiscal limit and not as a defence. The area inside it covered 13 sq. km. After 1850 it was replaced by roads. Tenements were built over large areas between it and the *Ringbahn* or circular railway, and the older area inside the Customs Wall gradually assumed its present character as the business heart of the capital. A wealthy residential quarter developed south of the Tiergarten (*Geheimratsviertel*). The Oranienburgervorstadt, Wedding and Moabit developed as industrial quarters north of the Tiergarten. In the next decades this area filled up quickly as a monotonous district of dreary tenements (see Fig. 105).

The pattern of communications in Berlin and its environs reveals the double characteristic of radial and concentric routes. The waterways are in the form of a letter H with the city spreading astride the Spree between the Havel and Spree-Dahme systems. The railway and road net are predominantly radial, with, however, two marked concentric belts. The *Ringbahn* is the circular railway that has formed such a fundamental physical barrier in the growth of the city. An outer and new autobahn encircles the whole of the built-up areas with a radius of some 30 km. from east to west and 15 km. from north to south. After about 1900 industry began to shift from the area inside the Ringbahn to widely scattered areas beyond it. There was, however, a relatively small outward shift of population, and a very large proportion of workers in the outer areas still lived in the tenement areas of the inner city.

The build of the city just before 1939 is shown on Fig. 107.

The *Kurfürstenstadt* is the oldest nucleus of the city. It consisted of Berlin and Kölln until the end of the seventeenth century, when it was fortified with thirteen great bastions. Much of it has old dwelling-houses dating from 1600 to 1800, although it has been invaded by the modern buildings of the city since 1860. Most of the area is taken up by shops,

Fig. 107.

1. Uniform building heights of four storeys and over.
 2. Varied building heights.
 3. Factories.
 4. Villas, single-family housing estates
 5. Allotment areas
 6. Watered meadows (*Rieselfelder*).
 7. Limit of Central City Area.
 8. Villages.
- Roman numerals refer to zones:
- | | |
|---|--|
| I. Medieval nucleus with sites of fortifications shown by (a) | III. Tenement areas of the late 19th century |
| II. Extensions of 17-18th centuries (<i>Vorstädte</i>), bounded by open spaces, public buildings, stations and railway tracks on the site of fortifications (b) | IV. Industrial-residential areas |
| | V. Outer residential (sub-urban) areas |

The original map was prepared by Professor H. Louis now of the University of Cologne. It is based on field observations by a student group and was published in 1934.

offices, textile workshops and warehouses and wholesale markets. There is an old built-up area on the border of the *Kurfürstenstadt* such as appears in many large cities, into which the functions of the "City" have gradually spread. It lies astride the site of the old fortifications. The zone is marked by public buildings, and narrow streets and small "places" on the site of the old fortifications and bastions.

The *Vorstädte* of old Berlin form a zone immediately outside the fortification belt of the old town. These areas were first built up after the erection of the fortifications at the end of the seventeenth century. Buildings show a mixture, like the *Kurfürstenstadt*, of the old and new, of stories, styles and uses, and there are old town houses of the latter half of the nineteenth century alongside much older three- and even two- and one-storied houses. There are numerous small trades and crafts, dating from the past, and more recent secondhand shops. Associated with these occupations is a large Jewish population. There are also many places of amusement, and outgrowths from beer-gardens formerly located on the outskirts of the town. A third of the theatres are in this zone. Its eastern side is a densely populated slum.

The Dorotheen and Friedrichstadt quarter was built at the end of the seventeenth century. Dorotheenstadt was built in 1673 with a rectangular grid plan centred on the Unter den Linden. In 1688 the Friedrichstadt was added to the south of it, with wider streets centred on the Gendarmenmarkt. The two were at first separated by a wall, and their street nets do not fit together, causing congestion today on the main streets. The whole quarter was designed for the residence of court officials. The western border abutted on the Tiergarten along the Wilhelmstrasse, which at the end of the eighteenth century became the residence of the nobility, and wealthy villa quarters appeared in the early nineteenth century.

Most of the above areas form the "city," which is thus completely changed in build and function. The Dorotheenstadt (near to the castle and museum district) contains the university quarter, and around the Friedrichstrasse station was the focus of amusements, shops and hotels. The financial and business district lies in the old Friedrichstadt.

The areas described above together formed the extent of the town in the middle of the nineteenth century. Far beyond the built-up area, however, there was the toll wall, erected in 1737 by Frederick William I, serving as the fiscal and police limit of the town. There was thus much open land between it and the edge of the town: only in the west did the two coincide. Schöneberg and Spandau actually extended as "suburbs" beyond the administrative limits of the town.

The Wilhelmian Period from 1850 to 1918 was the period of rapid growth in Berlin, its population increasing sixfold from 500,600 in 1860.

It is marked by the transformation of the core and the great extensions of the built-up area around it. The latter, a vast zone of monstrous blocks of multi-storied residential buildings, is the most characteristic feature of modern Berlin. This is the zone of wide, straight streets, with frontages of four- and five-story houses and, behind these, fully built-up blocks and large tenements. These districts have no factories; these are concentrated along the old toll wall and along the Spree. The whole zone thus lies between the old city and the outer, post-1918, zone.

The zone along the nineteenth-century fortifications and on the originally open land between these and the limits of the built-up area is distinct in its land uses. Open spaces (parks and cemeteries), public buildings, railways and stations, barracks, hospitals and some factories are its main elements. Densely built-up tenement areas lie between the sectors of this zone and extend to the Ringbahn. The western district of Charlottenburg is a lower middle-class residential district with a very large Jewish element. It changes outwards into a zone with frequent open spaces. An amusement quarter grew up after 1900 in this district.

Berlin is a great industrial complex. Over two-thirds of all its industrial establishments lie inside the Ringbahn, and almost two-thirds of all its occupied persons work in this inner area. But these establishments are small and are housed in small workshops. On the other hand, the fewer establishments outside the Ringbahn (finished in 1871) form vast industrial sites which have been laid out in the last forty years and have given the extensive outer zone its distinctive character. Many of these are firms that have shifted out from the inner town. Industrial plants and residential areas are separated by areas of allotments, meadows, water and woods, and are situated in relation to the railways and navigable waterways. The big industrial complexes lie along the two rings of communication and the through route of the river Spree, from Spandau to Köpenik.

This industrial-residential zone lies on the outskirts of Berlin and its development has been subjected to no public control. It contains many villages, which have been completely urbanized and form the nucleus of the present agglomerations. Most of the unbuilt areas are taken up by allotment gardens (*Laubenkolonien*), parks and cemeteries. Much land lies fallow, and only occasionally does one see a field of rye or potatoes.

Berlin has spread well beyond the industrial-residential zone since 1919. Villas, and rows of single-family houses, many with allotment gardens and orchards, occur scattered in the area. But its farthest outposts are the allotment gardens along the railways, which sell their food in the urban market. Villages are gradually being transformed. Motor-bus and electric railway connect the area with the city. The expanses of meadows, irrigated with sewage waste, provide dairy produce which is marketed in the city. There is an important industrial and residential

area along railway and canal to the north. Grünewald in the west is a well-known high-class residential district of villas in woods. The Teltow district is an industrial complex. The old towns of Spandau and Potsdam also lie in this outer girdle.

Berlin illustrates excellently the centrifugal trend in the development of modern industry and the movements of population in the great city. The outstanding fact is the effectiveness of the Customs Wall and then of the Ringbahn as barriers. Urban development was confined until the last decades to the oval area inside the Ringbahn, while during the last fifty years there has been a great shift of old industry from the *Altstadt* to the open spaces along road and waterway outside the Ringbahn. The decline of population began in the heart of the city and then spread outwards to the limits of the Ringbahn, while beyond it there has been a large increase since the last decades of the nineteenth century.

Out of a total population of 4,330,000 in 1939 about $2\frac{1}{4}$ millions lived inside the Ringbahn on an area of about 35 square miles with an approximate overall density of 100 persons to the acre. The central business district had densities of only 10 to 40 persons per acre of total area and the "mixed zone" around it of 40 to 80 persons per acre. The tenement district, however, had overall densities of 150 to 300 persons per acre and over. The southwestern sector, on the other hand—Charlottenburg and Tempelhof—is a middle-class residential area, and had lower densities of 30 to 60 persons to the acre. Outside the Ringbahn, built-up areas are scattered and separated from each other by large open spaces, so that overall densities by large administrative districts were much lower. These traits are characteristic of all the major Continental cities.

The location and shifts of industrial plants, and indeed, the life and existence of Berlin, as of all great cities, depend on its transport facilities by rail, water and road. Like all great cities, vast quantities of foodstuffs and raw materials are imported, while exports are much less bulky manufactured products of higher value. The total traffic to and from Berlin amounted to about 80 million tons in pre-war years. Of this total, four-fifths was inward traffic (coal, lignite and building materials), and one-fifth outward (iron and steel goods of all kinds, manures and chemicals). Two-thirds of the inward traffic is effected by rail, and one-third by water, whereas four-fifths of the outward traffic is effected by rail and only one-fifth by water.

The original intention of the municipal authorities was to concentrate rail and water traffic around the Lehrter station and the adjacent Humboldt harbour. But in 1907 two new municipal harbours were established to the east and west of the city. The Osthafen was opened in 1913. The Westhafen, begun in 1914, was not finished until the early 'twenties. The rail-borne goods traffic includes large marshalling yards on the out-

skirts of the city. Two of these lie far outside Berlin in the open countryside.

We may consider in conclusion the outer limits of Berlin. The administrative limits of Greater Berlin were formed in 1921 by the annexation of the surrounding communes that lay, for the most part, beyond the Ringbahn, which, in general, may be regarded as the limit of Old Berlin and of the present compact built-up area. The whole of Greater Berlin to its farthest boundaries lies within about forty kilometres radius of the city centre and all parts are accessible to the central business district in one hour by train. This area is, in effect, a single labour market. But it is made up of the most diverse forms of settlement that had little relation with Berlin before 1921. The limits of this Greater Berlin area include the old towns of Spandau, Potsdam and Köpenik, which have been incorporated into the economic and social sphere of Greater Berlin. The built-up area lies within a radius of twenty kilometres of the city centre along the various radial routeways. The districts to the north (Barnim) and south (Teltow) are higher platforms of open cultivated land that have been very little affected by industry. The districts to the east and west are wooded lowlands, traversed by the lakes and streams of the Spree and Dahme to the east and the Havel and Tegel Sees to the west. Oberhavel (Oranienburg and Henningsdorf) to the northwest, Potsdam—Nowawes—Teltow to the southwest, the upper Spree and Dahme (Wildau) to the southeast are outlying industrial areas that lie within the Berlin labour market. Eberswalde-Finow to the northeast on the Stettin canal, Brandenburg, and Luckenwalde are slightly farther field (about fifty kilometres distant), but just come within the Berlin labour market. There is an outlying belt within a journey-time of one and a half to two hours of central Berlin. This belt has little industry, and it serves mainly as an agricultural and outer recreational zone with outlying satellite towns (*Trabantenstädte*). The outer limits of this whole area, with a fifty-kilometre radius, is fairly clearly defined by the low-lying west-east valley trough to the north of the Finow and Berlin-Stettin canals; and to the south by the similar trough that runs from Brandenburg southeast through Luckenwalde and Baruth.

The six *Landkreisen* around Greater Berlin all show increases of population from 1925 to 1939 as against decreases in the districts of Brandenburg beyond them. The *Gemeinden* along the main lines of communication within a radius of twenty to thirty kilometres of the city centre nearly all show an increase from 1925 to 1939, whereas in the rural areas of Brandenburg farther field decreases are general. This is a certain indication of functional relations with the Berlin complex.

The initial distribution and relative importance of the towns of Brandenburg in the early nineteenth century have been affected by the

tremendous growth of Berlin. An indication of the extent of Berlin's influence is given by the area of high density of population in the North German Plain. This area lies between Stettin, Frankfurt and Brandenburg. It is bordered to the south by the thinly peopled, sandy uplands of the Fläming Heath and the wooded lake area between the Dahme and Spree, beyond which lies the Lower Lusatian textile area and the brown-coal field with its associated plants. To the west, beyond the marsh land between Werder and Brandenburg, there is a separate axis of high density along the Elbe, stretching from Wittenberg to Hamburg, which also owes its economic development in part to its close relation with the Berlin area.

POST-WAR SITUATION

Berlin grew to its pre-war size as the capital of Germany. As Fig. 59 shows it was responsible for 6 per cent of the total German industrial production. In 1939, 41 per cent of its people were dependent on industry, 25 per cent on commerce (exceeded only by Hamburg and Bremen), and 15 per cent on administration and service. Its principal industries were the electrical group and textiles. It produced a half of all machinery and electrical appliances; 40 per cent of clothing; a quarter of precision and optical instruments; and a fifth of the machine tools. The tonnage of goods coming into the city by rail in 1938 reached 13 million tons and outwards nearly 5 million tons. By water it received 17 million tons and despatched 1.2 million tons. One of its bulkiest imports was coal, and one-third of this came from the Ruhr, one-third from Upper Silesia, and the bulk of the remainder from various other districts in Germany, with a small part (3 per cent) coming from Great Britain. Nearly four-fifths of its foods (in value in 1936) came from Germany and a fifth from abroad, mainly through Hamburg. In regard to industrial commodities, 64 per cent of its output went to other German areas, 11 per cent went abroad; while imports in relation to consumption from Germany reached 64 per cent and exports 9 per cent.

These are the essentials of the pre-war economy of this great city. It was obviously primarily dependent on the German market. It is impossible for this pre-war economy to readjust itself to post-war changed circumstances. Berlin was seriously blitzed. It is reckoned that one-third of its houses are destroyed, and whole areas are laid flat. The population has fallen by a quarter. The whole city area is divided into districts by the occupying Powers and though the three western zones are now combined to form the western sector, this is a different world from the Russian-controlled eastern zone, that lies beyond the Brandenburger Tor and the Potsdamer Platz. Moreover, Berlin, in accordance with the Potsdam Agreement, is situated in the midst of the

TERRAIN MAPS

The following maps show examples of different types of country in Germany. They should be compared with the outline maps of Terrains, the key to which is shown on Fig. 62.

The Terrains, as numbered in the captions, refer to these outline maps and to the list discussed in the chapter on "Landscape and Region."



FIG. 108. TERRAINS OF THE NORTHEASTERN LOWLAND

The wide river plain of the Oder is cut into the raised diluvial platform and bordered by steep scarplets. The platform is well wooded (Terrain 4) or cultivated (Terrain 2). The Oder plain was drained and brought under cultivation in the 18th century and is today arable land (Terrain 1a). The Oder river and its old course (Alte Oder) are dyked and form strips of meadowland. Note the village sites and their plans. (1:100,000, Sheet 245, Bad Freienwalde.) (Locate in N.E. corner of Fig. 104.)



FIG. 109. TERRAINS OF THE NORTHEAST MORAINIC COUNTRY

Hilly morainic country with shallow lakes that are in part silted and marshy. Here too are the hollows described as *Söllen*. To the southeast are sandy outwash areas (*Sander*) that slope gradually southwards and are covered with pine forest (Terrain 4). Dispersed farmsteads (1:100,000, Sheet 247, Soldin.)



FIG. 110. TERRAINS OF THE NORTHWEST MARSHLAND

The marshland is protected by a dyke from flood from the sea. Numerous dykes and ditches and isolated farmsteads characterise this area. New reclamation is in progress by means of dikes (*Groden*). (1:100,000, Sheet 142, Wilhelmshaven.) (Locate in Fig. 84.)

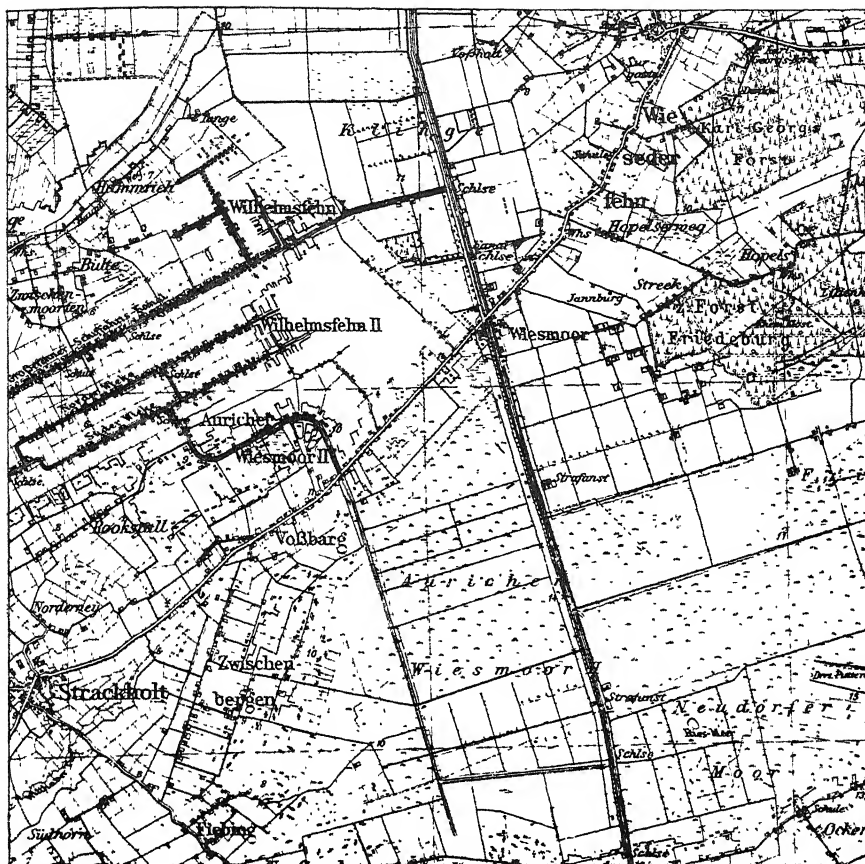


FIG. 111. TERRAINS OF THE NORTHWEST MOORLAND

In the S.E., wild *Moor* or Bog, partly cut by drainage canals. To the W., cultivated bog with meadows and arable, and *Fehnkolonien*, i.e., farmsteads strung along the main canal. In the N.E., an island of dry, wooded, sandy *Geest*, rising 60m. above the *Moor*. (1:100,000, Sheet 173, Aurich.) (Locate in Fig. 84.)

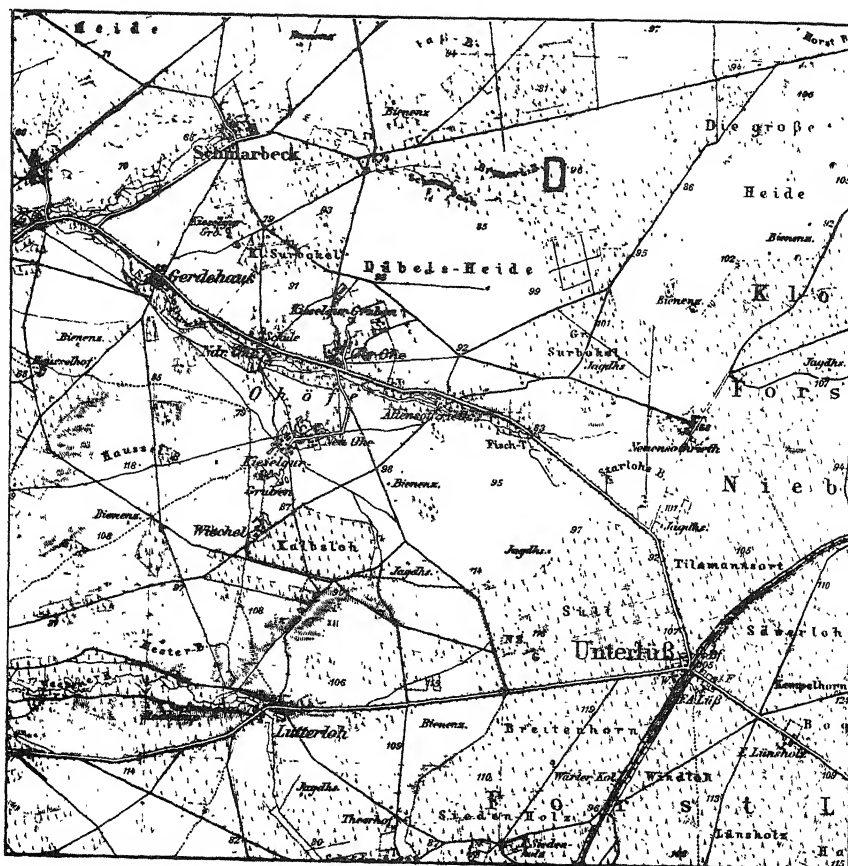


FIG. 112. TERRAINS OF THE NORTHWEST HEATHLAND

This is part of the Lüneburg Heath. It is the sandy *Geest* (Terrain 3). In the S.E. is the ridge of the Löss, a deeply-dissected terminal moraine of the middle Ice Age that is covered with extensive pine woods. There are a few villages, lying along the streams, and isolated farmsteads on the heath. (1:100,000 Sheet 237, Soltan.) (Locate on Fig. 85.)

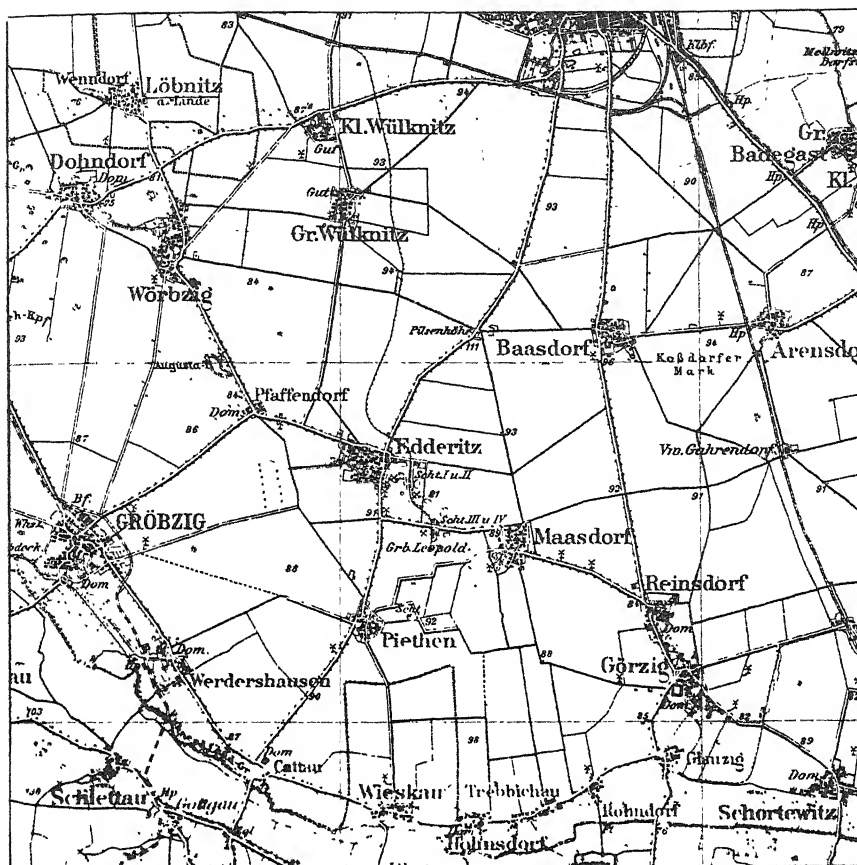


FIG. 113. TERRAIN OF THE SAXON BAY LOESS LAND

The loess-covered undulating or flat plain is entirely devoid of trees. It is entirely under arable cultivation except for the very narrow strips along the main stream beds. Settlement is confined to large compact villages. Characteristics of Terrain 5. Note the Slav suffixes, of the village names (nitz), and the German suffixes (dorf, hausen). These are irregular, compact villages, or *Haufendörfer*. (1:100,000, Sheet 364, Halle a.d. Saale, North.) (Locate on Fig. 81.)

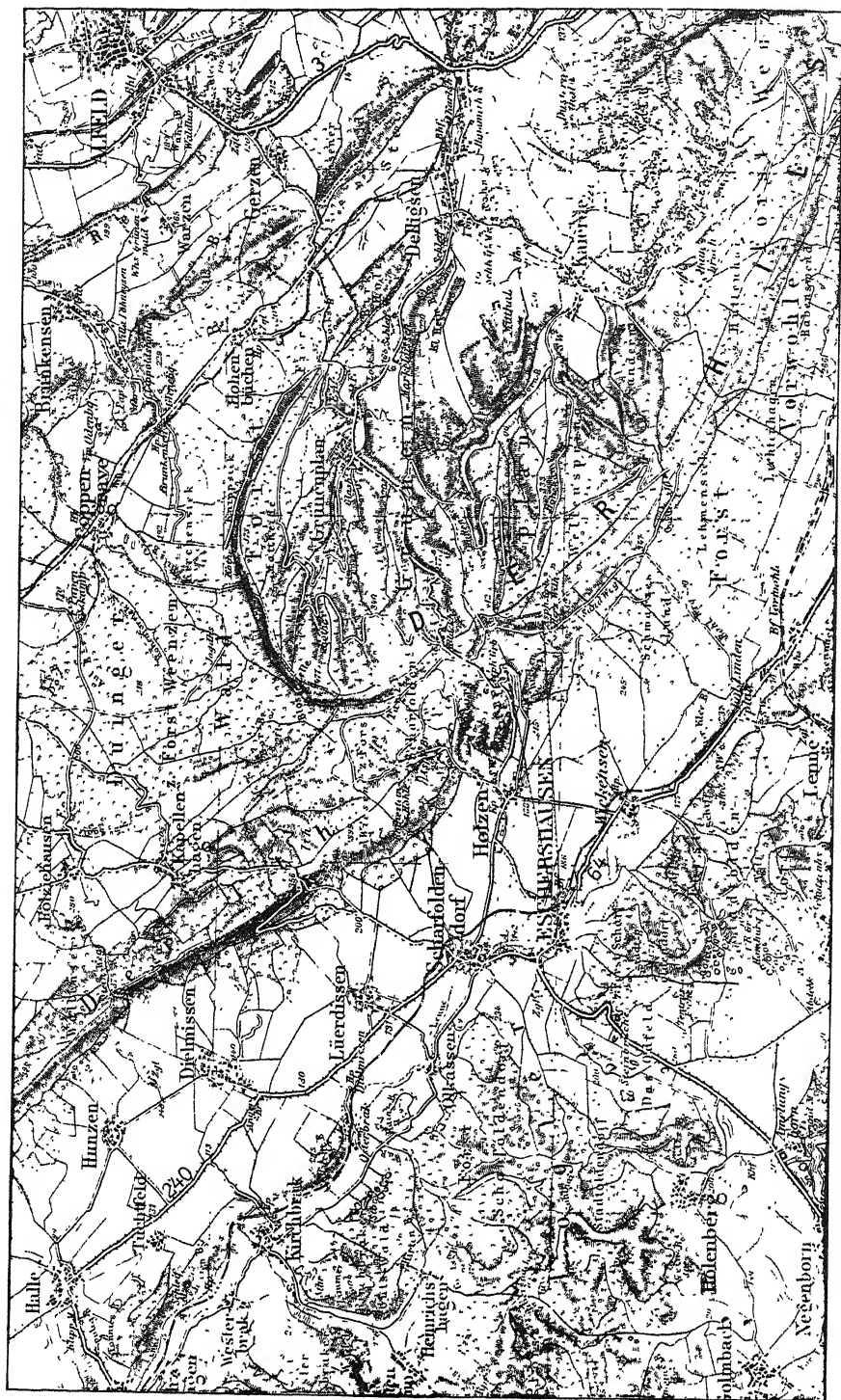




FIG. 115. TERRAINS OF THE RHINE GORGE

The Rhine gorge is incised into the undulating surface of the Rhine Plateau. The deep steep-sided valley is so narrow that there is scarcely room enough for the road and railway. The sunny facing slopes are under vine cultivation, whereas the shady slopes are left in coppice (*Niederwald*). (1:100,100, Sheet 505, Boppard.) (Locate on Fig. 68.)

FIG. 114. TERRAINS OF THE WESER-LEINE UPLANDS:
RIDGE AND VALE RELIEF

The relief is closely dependent here on the geology. In the W. occur Buntersandstone and Muschelkalk. Then follows an eroded lowland in soft (Keuper and Jurassic) clays, that are under the plough. The Ith is a monoclinical ridge developed on Malm limestone, the Hils a similar ridge on sandstone of Lower Cretaceous date. The synclinal arrangement of the Cretaceous series east of the Ith-Hils ridge can be easily detected in the lie of the relief. (See the block diagram on Fig. 83.) (1:100,000, Sheet 334, Höxter.) (Locate on Fig. 80.)

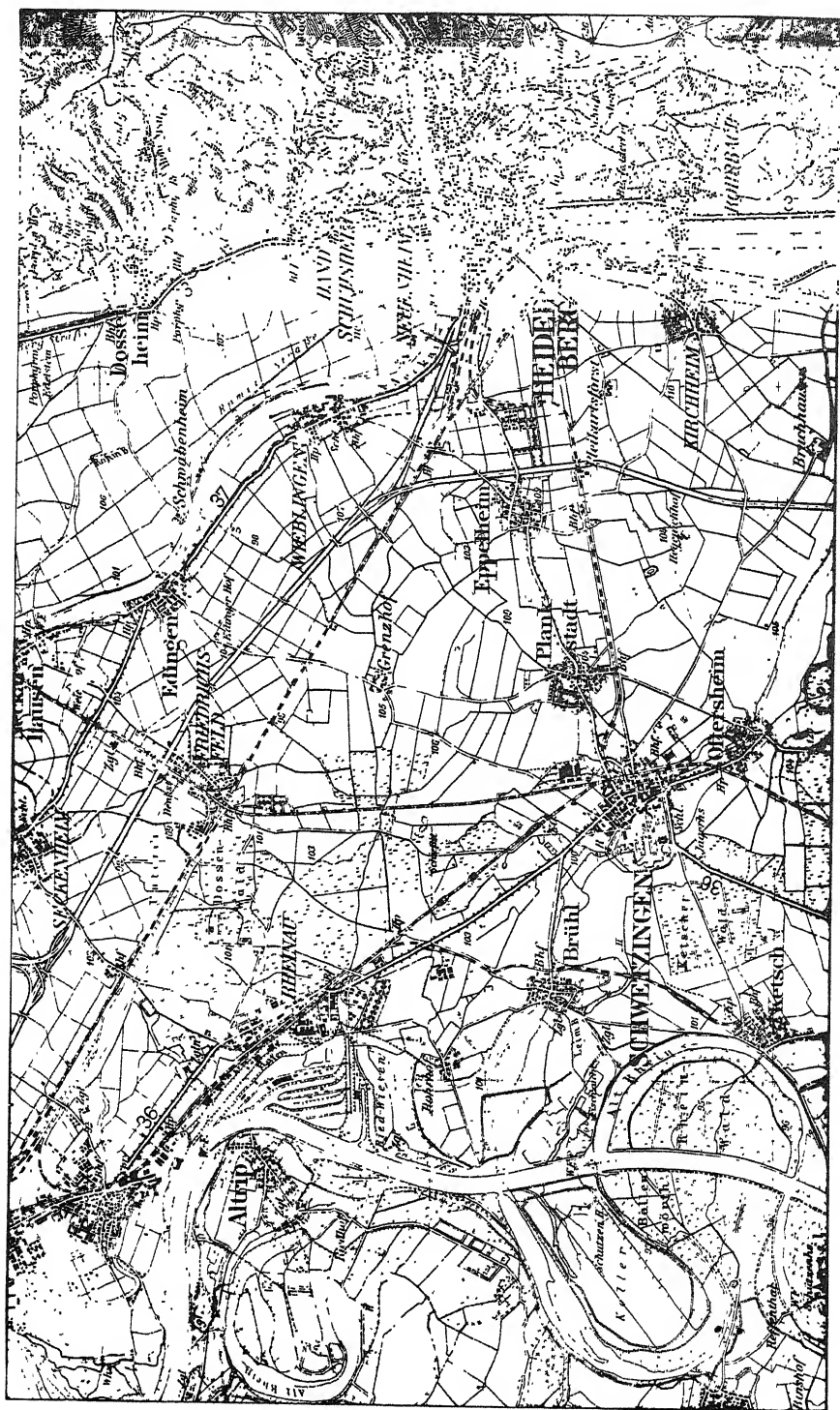


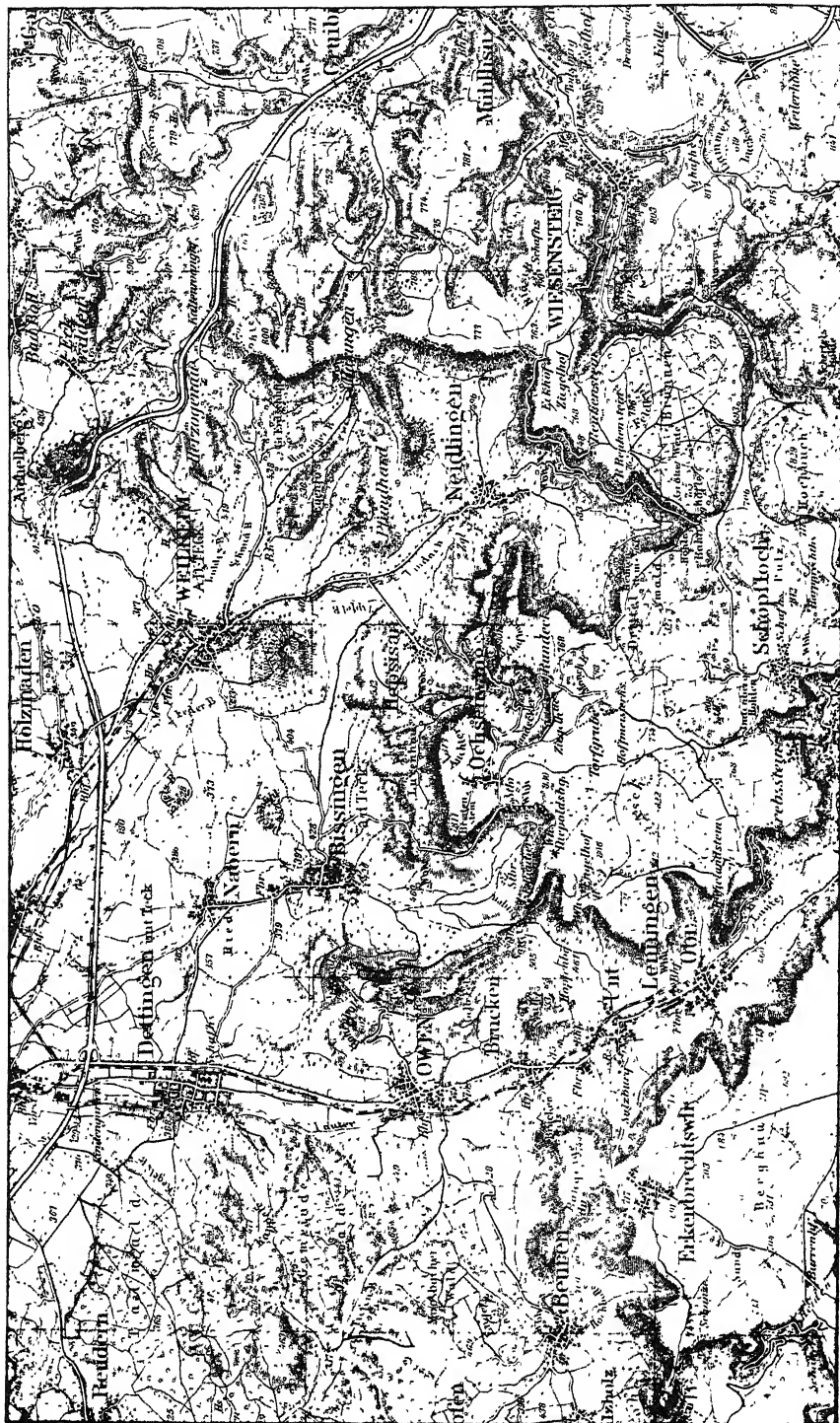


FIG. 117. TERRAINS OF THE BASALT HILL COUNTRY IN HESSE (WALDECK)

In the W. a dissected and wooded Buntersandstone plateau. In the E. a Tertiary depression, mainly under the plough, especially on loessic soils, through which there protrude basalt necks as steep-sided wooded hills. (1: 100,000, Sheet 383, Arolsen.) (Locate on Fig. 80.)

FIG. 116. TERRAINS OF THE UPPER RHINE PLAIN

In the east, the Buntersandstone plateau of the Odenwald, cut through by the gorge of the Neckar river (Terrain 12). A steep fault scarp slopes to the Plain. The alluvial fan of the Neckar is covered with loam soil and is a fertile arable area (Terrain 5). On both sides of the Rhine flood plain are wide gravel terraces, that are frequently covered with forest (Terrains 3 and 4). The course of the Rhine is artificial, leaving many isolated oxbows and old abandoned watercourses, that are occupied by damp meadows and woods (*Auenwald*). (1:100,000, Sheet 558, Mannheim.) (Locate on Fig. 90.)



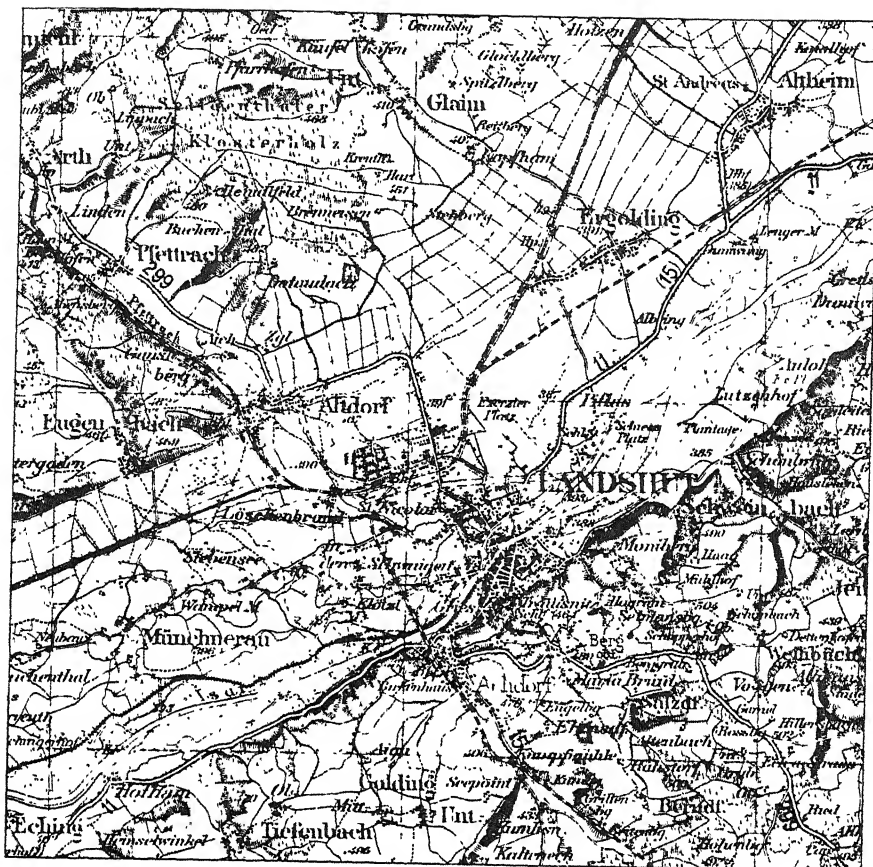


FIG. 119. TERRAINS OF THE LOWER BAVARIAN HILL COUNTRY

This Tertiary hill country is hummocky with many clear-cut valleys that were formed in a peri-glacial area. The arable areas are frequently interrupted by small woods. It is closely settled with small villages and hamlets, and numerous isolated farmsteads. The valley of the Isar, bounded by steep slopes, is under grass, the river itself being accompanied by damp woodland (*Auenwald*). Landshtut has a typical site. (1:100,000, Sheet 611, Landshtut.) (Locate on Fig. 97.)

FIG. 118. TERRAINS OF THE SOUTHERN SCARPLAND

In the S.E. the high platform of the Swabian (*Schwäbische*) Alb, that drops by steep scarp zone to the N. At its feet lies the eroded platform level of the Lias clays, a fertile arable land with numerous orchards, and large compact villages (Terrain 5a). Between Dettingen and Weilheim are small basaltic hills. (1:100,000, Sheet 606, Göppingen.) (Locate on Fig. 96.)

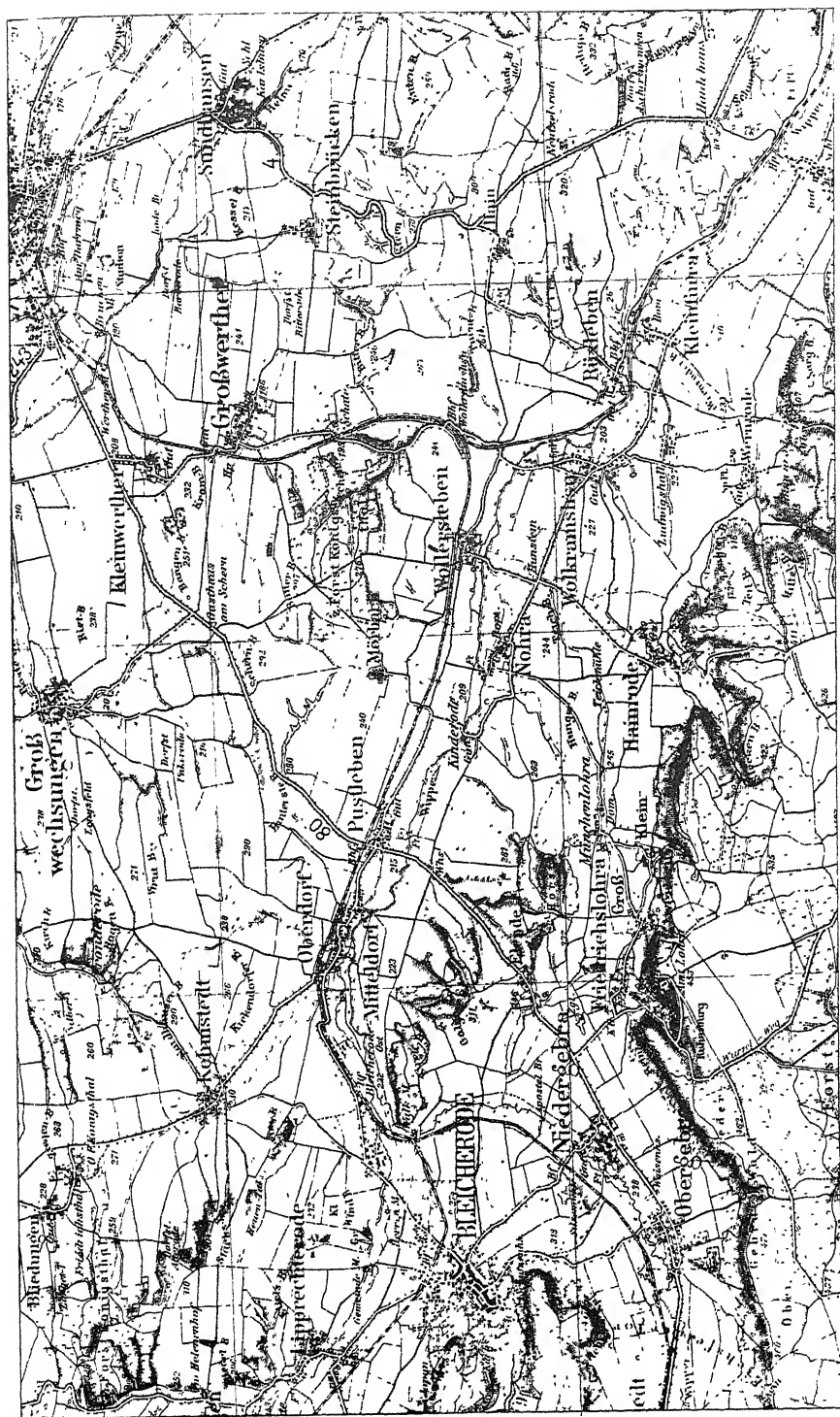


FIG. 120. TERRAINS OF THE UPPER BAVARIAN TERMINAL MORAINÉ COUNTRY

Terminal moraines form steep-sided hills covered with coniferous woods. These are separated by glacial overflow channels directed to the north that are occupied in part by the present rivers, such as the Wertach. High altitude (650-700 metres) and high precipitation account for the predominance of grassland. Compare with the Terrain Areas shown on Fig. 96, for terrace levels. (1:100,000, Sheet 649, Kaufbeuren.)

FIG. 121. TERRAINS OF THE THURINGIAN LOWLAND

The basin consists of (Keuper) marl beds, and the periphery of (Bunter) sandstone and Muschelkalk (limestone). From the undulating Buntersandstone plateau (Terrain 12) rise the steeply scarped hills of the Muschelkalk (Terrain 6). The limestone hills are covered with beechwoods, the valleys are narrow and steep-sided. There is a gradual slope northwards to the marl lowland that is covered with loess and is almost entirely under arable cultivation (Terrain 5). (1:100,000, Sheet 386, Bleicherode.) (Locate on Fig. 91.)



Soviet-occupied zone. It is an outlier of west Germany and the differences between the west and the Soviets hinder the free flow of goods and people across their boundaries. Berliners cannot freely move between, or do business in, the two sectors; the city cannot freely serve its surrounding tributary area of Brandenburg; and the city is removed from its markets in western Germany; but must seek compensation for lost sources and markets in the east. The eastern sector is short of supplies and is probably worse off than the western sector since the latter has been substantially bolstered by E.C.A. aid. Most of the people with the requisite skills are still in Berlin, but this does not compensate for the erection of new frontiers, severance from the supplies of Upper Silesia (coal), and the additional costs imposed by the long distance between Berlin and the sources of raw materials in the west. It is no wonder that in the western sector there are still some 250,000-300,000 unemployed persons. Difficulties have been added to since June 1948 by the introduction of different currencies in the western and eastern sectors. In spite of these differences, however, there are still many people who live on one side and work on the other, receiving their pay in both currencies. In the eastern sector there seems to have been little clearance of rubble or rebuilding, and there is a lower standard of living as compared with the western sector. Yet the former has relatively little unemployment. Output has shot up through the Two Years Economic Plan, but the sector lacks coal, steel, and machinery, which it must get from the west, although goods in export in exchange have been slow in forthcoming. The air-lift to Berlin as a counterblast to the Soviet blockade was a valiant vindication by the United States and Great Britain of their policy to maintain their outpost, in spite of the odds against them. But such an artificial situation could not be continued indefinitely. The city government of the western sector was bankrupt in the winter of 1949. Credits were provided by the Bonn government, backed by E.C.A. funds. These funds are being used for investment in heavy industry, commerce and transport, and housing. The repair of damaged houses and the completion of social housing projects should make available 60,000 dwelling units. Moreover the western commandants revalorized the pre-occupation Reichsmark on 31 December 1949, at the rate of 20 RM. to 1 DM., which has made large capital sums available to the city. All these measures are expedients to put on its feet a community that depends for its livelihood on trade with the rest of the old Reich. The people need jobs and this means capital reinvestment and free import of raw materials and food and export of manufactured products. And as long as the divide between east and west continues in Germany as a whole and in Berlin in particular, the city cannot survive except at great cost to both the Western Powers and the Soviet Union.

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- 1 : 200,000. *Geologische Übersichtskarte von Württemberg*, 1930. Four sheets.
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- 1 : 250,000. *Geologische Übersichtskarte von Bayern*, 6 sheets.
- 1 : 400,000. *Geologische Übersichtskarte von Sachsen*, Sächsisches Geologische Landesamt, 1930, one sheet.
- 1 : 800,000. *Geologische Strukturkarte von Deutschland und Seinen Nachbar-gebieten*, by A. J. Walther, 1920, 4 sheets and text.

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The following authorities of the Reich and of its constituent states have been concerned with the production of maps since 1870.

Reichsamt für Landesaufnahme, Berlin. From 1875 to 1919 this was the *Preussische Landesaufnahme*.

Sächsisches Landesvermessungsamt, Dresden. *Württembergisches Statistisches Landesamt* (known as *Topographisches Büro* since 1937), Stuttgart.

Bayerisches Landesvermessungsamt, Munich.

Badische Wasser-und Strassenbaudirektion and *Badisches Finanz-und Wirtschaftsministerium, Abteilung für Topographie*, Karlsruhe.

The *Reichsamt für Landesaufnahme* has controlled map production over three-quarters of the Reich and indirect control over the remaining quarter. The Standard Maps alone are listed below.

- 1 : 25,000. *Topographische Karte (Messtischblätter)*. Over 6,000 sheets, of which three-quarters were produced by the *Reichsamt für Landeskunde*, the remainder by the other survey services.
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INDEX

- Aachen, 172, 233, 248-9, 473-4
 - Industrial District, 473-4
 - Lowland, 35
- abandoned villages, 137
- abolition of serfdom, 345-6
- adjustment to physical conditions, 407-8, 418-19, 424-5
- administrative devolution, 364
 - hierarchy, 341
 - units, 341-2
- Adolf Hitler Canal, 260
- aerial bombardment, *see* bomb damage
- agriculture, 202 ff.
 - land use, and rural economy, in Bavarian Plateau, 588 ff.
 - in Brandenburg, 646 ff.
 - in Central Germany, 620 ff.
 - in Lower Rhineland, 461 ff.
 - in Lower Saxony and Hesse, 494 ff.
 - in the Nordmark, 605 ff.
 - in the Rhine Massif, 429 ff.
 - in the South German Scarplands, 566 ff.
 - in Southwest Germany, 537 ff.
- agricultural produce, foreign trade in, 303-4
 - production, 105, 192-4, 196, 210-11, 217, 288-9
 - in 1936, 385
 - post-war, 374-5, 380
 - of Western Germany, statistics, 396-7
 - regions, 216-26
 - surpluses, 266-8
 - post-war, 388
- Ahr valley, 444
- Alb, 46, 203, 564, 578-81
- Albert the Bear, 349
- Alemanni, 90, 545-6, 559, 600
- Alfold, 287
- Allgäu, 209
- Allgäu Alps, 599-600
- Allied Control Council, 367, 371
 - High Commission, 369
- alluvial plains, 408
- Alpine Foreland, 537, 585-6
 - stock, 315-16
- Alps, 47-9, 118, 599-600
- Alsace, 358, 537, 544
- Alsace-Lorraine, 340
- Alster, 517, 521
- Altenkirchen, 454
- Altmark, 332-3, 348-9, 497, 645-6
- aluminium, 237, 240
- amalgamation of territories, 333
- Amsterdam, 118, 260, 274-5
- Angerdorfer, 141-2, 144
- Anhalt, 340
- annexations, 320, 322, 332
 - by Prussia, 339
- Anschluss of Rhinelands, 343, 347, 357
- Antwerp, 260-1
 - transit trade, 274, 278
- arable farming, 215, 217-22
 - land, 202, 207-8, 223-6
- Arbeiterkolonien, 483-4
- Ardennes-Eifel Block, 429
- Aschaffenburg, 551
- Atlantic Period, 74
- Aufklärung, 357
- Augsburg, 157, 172, 592
- Austria, 338-9, 355
 - reduction of, 334
- Bad Ems, 458
- Baden, 333, 340
- Baden-Baden, 558
- Baltic coast, 602 ff.
 - control of, 320
 - lands, 166, 168
 - ports, 252, 260, 263-5, 609-14, 616-18
 - hinterlands, 279-80
 - provinces, 280
 - agriculture of, 217-19, 223-4
- Sea, 26, 28-9
- Uplands, 69, 651-2
- Bamberg, 577
- barge capacities, 253, 258
- barley, 210
- Barren, 449
- Barmin and Lebus, 651
- basalt, 512-13
- Basel, 258, 298, 546
- Bavaria, 139, 284, 340, 584 ff.
 - dukedom, 354
 - growth of, 329, 332-4, 336, 353-7
- Bavarian Alps, 226, 599-602
 - Foreland, *see* Alpine Foreland
 - Plateau, 46, 585-602
- Bayreuth, 575
- Bayerischer Wald, 582-3
- Beeskow-Storkowerland, 649-50
- beet sugar, 508
- Belfort, 538
- Berchtesgaden Land, 601-2
- Berge, 565-6
- Bergisches Land, 414-15, 448

- Berlin, 118, 172, 201, 244, 254, 647, 656-65
 post-war situation in, 664-5
 Agreement, 387
 Beuthen, 172
 Bielefeld, 172, 504-5
 birth rates, 99-101, 103-4, 120-2
 bishoprics, 317-18, 327, 322; *see also* Ch. 17 onwards
 Bismarck, 339, 344-7
 Bitburg Land, 445
 Bizonia, 372
 Black Death, 169
 black earths, 22, 207, 222, 507, 638
 Black Forest, 41-2, 44, 537-9, 556-9
 block system, 126, 138
 blockade, 374-5, 387
 blown sands, 33
 Bodden, 26, 614
 Bochum, 172, 488, 491-2
 Bohemia, 338-9
 Bohemian Forest, 582
 Highlands, 225
 Massif, 37-8, 41
 Böhmer Wald, 583-4
 bomb damage, 382-4, 469, 489-90, 526-7, 533, 614
 Bonn, 172, 468-9
 Government, 369
 Bonngau, 468
 Börde, 34, 37, 493, 506-11, 637
 Border Uplands, 539
 Boreal Period, 74
 Brandenburg, 282, 348-9
 growth of, 645-6
 Breisgau, 541
 Bremen, 172, 260-5, 280-2, 527-33
 hinterland of, 275, 277-8, 530
 Bremerhaven, 261, 265, 528-30
 Brenner Pass, 162
 Breslau, 172, 284-5
 brewing, 250
 British coal output, 299
 brown coal, *see* lignite
 brown forest soil, 67, 69
 Brunswick, 172, 285, 508-9
 State, 340
 Brussels, 118
 Budapest, 287
 building trades, 231
 Bunter Sandstone, 41, 45
 burghs, 156
 Burgundian Gate, 538, 546

 Canal d'Alsace, 361
 canals, 251-2, 257-60, 611, 617-18, 642
 capacity of, 253, 258
 construction, 252-3, 535-6
 in Ruhr, 482
 Carboniferous rocks, 17-18
 Carinthia, 338
 Carolingian period, 156-7
 Carolingians, 552, 589
 Carpathians, 287
 cartels, 229-33, 344, 482

 cash crops, 219-20
 castles, 441, 454, 457-8, 633
 Catholic Centre Party, 347, 358
 Catholicism, 317, 319
 cattle, 211
 Celle, 500
 Central Germany, 285, 619-44
 Central Uplands, 37, 219-20, 223, 225
 ceramics, 249, 454
 cereal import, 303
 Chalk, 42
 charcoal, 227-8, 439
 Charles the Great, 504, 516
 chemical industries, 229, 231, 237, 245-7
 Chemnitz, 172, 285, 624-5
 chernozem, 67-9
 Christian Socialists, 347, 358
 city-region, 189
 classification of landscape, 404, 412-14
 of terrain types, 408-11
 clayland, 410
 climate, 54-60
 regional variations, 61-3; *see also* Ch. 17 ff.
 tables, 64-6
 and agriculture, 212-13
 and soils, 222
 climatic changes, 74-5, 80
 phases, 74-5, 80
 clothing manufacture, 231, 233
 coal consumption, 279, 299
 dispatch from Ruhr, 283-4, 297-8
 distillation, 245, 247
 export of Britain and Germany, 301
 export from Ruhr, 297
 imports of Western Europe, 302
 in foreign trade, 299-302
 production, 193-4, 230-1, 233-5, 299
 of Germany, 302
 of Western Germany, 398
 post-war, 373
 railborne, 255-6
 trade, 268-70, 299-304
 pre-war, 389-90
 post-war, 390-1
 competition in, 299-302
 types in Ruhr, 480
 waterborne, 258-60
 coal and coke import, 289, 291, 297-302
 export, 289, 297 ff.
 coalfield of Ruhr, 479 ff.
 coalfields, 111, 114, 229 ff.
 production of, 299-300
 coast, Baltic, 26, 602 ff.
 North Sea, 23, 26, Ch. 20
 Coblenz, *see* Koblenz
 coke, 229-30, 240-1
 production, 241
 trade, pre-war, 390
 post-war, 391
 coking coal, 480
 trade, 297-8
 Cologne, 111, 118, 171-2, 258, 469-72
 Cologne Bay, Cologne Lowland, 35, 461-4, 466-73

- colonies, 194
- colonisation east of Elbe, 92-4, 141, 166-9
 - in Saxony, 351
- colonists, 95
- commercial centres, map, 281
 - farming, 346
 - regions, 280-5
- common land, 132, 143
- commodity movements, external, 296-304
 - internal, 265-74
- Communism, 392
- commuters, 555
- Confederation of the Rhine, 339, 358
- confederations of tribes, 322
- Congress of Vienna, 333
- Conrad the Great, 351
- consolidation of holdings, 126, 130-2, 137, 143, 215, 346
 - of territories, 336-42
- Constanx, 598-9
- consumption of imported foods, 396
- conurbation of Berlin, 663-4
 - of Dresden, 626
 - of Rhine-Main, 551-6
 - of Ruhr, 484 ff.
- conurbations, 170-3
 - population table, 172
- copper, 227, 239
- Cottbus, *see* Kottbus
- cotton, 229, 247-8, 262-3
 - import, 289-92
- Council of Europe, 389, 393
- Counter-Reformation, 355
- country towns, 419
- Cretaceous rocks, 18
- cropping systems, 215, 218 ff.; *see also*
 - under agriculture
- crops, 210
- cultural divides, 336-7
 - influences, 429, 432-5
 - landscape, defined, 402
 - unity, 311
- culture contacts, 312, 402
- curtes, 477-8, 493
- customs union, 193, 241, 252, 339, 343, 360
- Cuxhaven, 23, 523
- dairy produce import, 303
- dairying, 219, 222
- Danube, 37, 46, 161
 - lands, 95, 156, 221, 287
 - navigation, 258, 589
 - valley, 585 ff.
- Danzig, 262, 264-5, 280
- Darmstadt, 172, 551
- death rates, 99, 104
- Deckenschotter, 586-7
- deficiencies of foodstuffs, 289, 303
- degree of relief, 404-5
- degrees of slope, 405
- deltaic deposits, 461
- demographic trends, 99-105
- depopulation, 120-1
- Dessau, 649 •
- Deutsche Bund, 306, 333-4
- Deutsches Reich, 306, 309, 344
- Deutschland, 306-10
- dikes, *see* dykes
- Dinkelberg, 539
- disintegration of territories, 326-7, 332
- Diet, 334
- direction of trade, 290 ff.
 - post-war, 399
- dismantling, 371-2, 375
- dispersed settlement, 134
- district names, 426-7, 606-7
- Dollart, 533-4
- Donaureid, 590
- Donetz coalfield, output, 299
- Donken, 411-13
- dormitory towns, 554-5
- Dortmund, 118, 157, 171-2, 478, 488-9, 491-2
- Dortmund-Ems Canal, 253, 482, 488, 496, 534-5
 - traffic, 279
- dredging, 464, 516, 521, 523
- Dresden, 171-2, 249, 285, 626-7
 - Basin, 625-6
- Duisburg, 171-2, 261, 298, 484-6, 491-2
- dukedom, medieval, 323-6
- dunes, 81, 543
- Dungau, 589
- Düsseldorf, 172, 258, 472
- Dutch Limburg, 473-4
- dykes, 527, 543, 604, 607
- East Bavarian Highland, 583
- East German Democratic Republic, 369, 374-8
- East Hesse Depression, 512, 514
- East Prussia, 338-9, 349
- Eastern Germany, 374-8
- Eastern Lowlands, 36
- Eastern Morainic Uplands, 606-7
- Eastphalian Upland, 39, 503
- economic crises, 480, 482
 - development of Ruhr, 480-2
 - regions, map, 199
- economy, since 1945, 370 ff.
- Eder, 511-12
- edible oils and fats, 250
- Eifel, 429, 442-6
- Einzelhöfe, 144
- Elbe, 92, 242
 - basin, 115, 119, 236, 619 ff.
 - bridges, 523
 - crossings, 517, 523
 - estuary, 516, 520-1
 - navigation, 252-3, 258-60, 276
 - traffic, 276
- Elbe-Trave Canal, 611
- Elberfeld, 230, 449
- Electors, 349, 351, 355
- electric power, 236-7
- electricity, 229, 398
- electro-technical industry, 231, 236, 244-5
- emancipation of peasants, 132, 143

- emigration, in Middle Ages, 94, 166, 168
 - to New World, 95
 - oversea, 98, 120-1
 - to Prussia, 95
 - to U.S.A., 261, 528
- employment, post-war, 373
 - statistics, 196, 395
- Emden, 260, 265, 495-6, 533-6
 - hinterland, 275, 277, 279
 - traffic of, 279
 - trade, 263
- Ems, 495
 - estuary, 533-5
- Emscher, 480, 488-9
- enclosure, 131, 143-4
- engineering, 241-4
- entrepôt trade, 527
- entrepôts, 275-6
- Erfurt, 172, 634-5
- Erzgebirge, 350-1, 621-3
 - Basin, 624-5
- Esch, 134-6
- Essen, 171-2, 482, 486-8, 491-2
- estates, subdivision of, 214-15
- estate villages, 146
- ethnic area, 310
 - characters, 315-17
 - groups, 104
 - traits, 310, 315-17
- European Economic Co-operation, 392-3
- European trade of Germany, 292-6
 - direction of, 293-4
- Eupen, 474
- explosion craters, 444
- export surpluses, 292-3
 - tables, 290-1
 - tonnages, 289-91
 - values, 288-91
- exports, 260-5
 - since 1947, 373-4, 387
 - tables, 398-9
 - by water, 258
 - of selected cities, 279
- expulsions, 378
- external trade, direction of, 290 ff., 399
 - tables, 290-1, 399
- extra-European trade, 289-302, 399
- fairs, 254, 359
- farm economy, 211 ff.
 - incomes, 217 ff.
 - sizes, 213-15
- farmhouses, 152-5
- farmsteads, 148-55
 - in Neckar Basin, 423
- fault-scarps, 561
- faulting, 468, 512, 539, 560-1
- Fehnkolonien, 143, 146
- fertilizers, chemical, 245-6
- Federal Diet, 369
 - Republic, 369
- federalism, 348, 361-2
- federation, 389
- feudal services, 132
 - system, 130-1
- feudalism, 326-7
 - abolition of, 345-6
- Fichte, 307, 345
- Fichtelgebirge, 37-8, 139, 583-4
- field systems, 125-32, 137-8, 141, 147; *see also* Ch. 17 onwards
- Filder, 565-6
- finished goods, trade in, 290-1
- five-year plans, 194-5
- flax, 228-9, 248
- Fläming, 652-4
- Flensburg, 608-10
- Fliesencomplex, 414-16
- flood plain of Upper Rhine, 542-4
- Flysch, 599-600
- fluvio-glacial deposits, 46
- fodder production, 303-4
- folding, Alpine, 18-19, 20, 42, 52, 585
 - Hercynian, 17-18, 52
 - Mesozoic, 19, 52
 - Tertiary, *see* Alpine
- food consumption from imports, 396
- foodstuffs, internal trade, 266-8
 - in 1936, 385
 - post-war, 387
 - manufacture, 231, 233
 - trade, 288-9, 303-4
- Förden, 26, 32
- foreign labour, 98
 - markets, 289
- Foreign Ministers' Conference, 372
- foreign trade, 193, 195, 260-5, 286-304
 - tables, 290-1, 397, 399
 - of Western Germany, 397
 - see also* external trade
- forest, 74 ff., 202-7, 223-6, 405
 - clearance, 73-6, 91-2, 128, 133, 138
 - products, 292
 - types, 76-7, 405-6
 - village, 142
- form units, 419
- four-course system, 128-9
- Franconia, 45, 336-7, 537, 564, 568-81
- Franconian Alb, *see* Alb
 - Jura, 139, 579
 - Platform, 568-76
 - Scarp, 576
- Frankenwald, 583
- Frankfurt a.d. Oder, 651
- Frankfurt-am-Main, 171-2, 254, 552-6
- Frankfurt Agreement, 387
- Frankish dialects, 314
- Franks, 88-91, 354, 504, 545-6
- Frederick the Great, 345, 349, 534
- Free Cities, 332-3
 - in 1939, 340
- free harbours, 522, 529
- Freiberg, 622
- Freiburg, 172, 547
- French influences, 343, 347, 357-8
- Friedrichshafen, 599

- Friesians, 90-1
 Friesland, 604-5
 Frisian dialect, 312-14
 Frisian Islands, 604
 frontier zones, 347-8
 frontiers, 114-15, 338
 ethnic, 88
 in Rhinelands, 358
 of Reich, 319-22
 of settlement, 92-3
 frost, statistics, 55-6
 fruit import, 290-1
 fuel consumption, 299
 wood, 299
 Fulda, 511-12
 functional units, 418-19
 functions of towns, 164-7, 173-7
- Galicia, 287
 Gau, 323-5, 426-7
 Gaue, 564-6
 Gdynia, 280
 Geest, 36, 408, 494-500, 516, 527, 604-6
 Geestemünde, 530
 Gelsenkirchen, 172, 480, 489, 491-2
 Gemeinde, 418, 421-5
 geological evolution, 17-22
 succession, tables, 51-2
 geology of Bavarian Plateau, 585 ff.
 of Brandenburg, 645 ff.
 of Central Germany, 621 ff.
 of the Lower Rhineland, 460 ff.
 of Lower Saxony and Hesse, 494 ff.
 of the Nordmark, 604 ff.
 of the Rhine Massif, 428 ff.
 of the Ruhr, 479-81
 of the South German Scarplands, 564 ff.
 of Southwest Germany, 537 ff.
 German Confederation, 306-7, 333-4, 339
 culture, 310-11
 dialects, 312-14
 speech, 47, 88, 92-3, 95, 306-15
 Germany, future rôle, 391-3
 Gewandorf, 128, 133, 141, 144-5
 Gewanne, 126-8
 Giessen, 515
 glacial deposits, 29-33, 36, 69
 glaciation, 20-2, 48
 glaciers, 586-7, 592, 596-7, 602
 Gladback, 172
 glass, 227-8, 248-9
 Gleiwitz, 172
 gold, 227
 Goldene Aue, 637
 Görlitz, 627
 Göttingen, 504-5
 Grafschaft, 323
 grain import, 289, 291, 303
 trade, 266-8
 crops in Middle Ages, 129-30
 grassland, 202, 207-10, 223-6
 Great Cities, 201
 Greater Berlin, 663
- growth of towns, *see* towns, development of,
 and morphology
 Gründerzeit, 344, 360
 Grundgebirge, 41-2
 Guben, 650
 Gubenerland, 650
 Gutshöfe, 143, 146
- Haardt, *see* Pfälzer Wald
 Hagrstrang, 475-6
 Habsburgs, 332, 558
 haffs, 26, 614
 Hagen, 172, 449-50
 Halberstadt, 507
 Halle, 172, 285, 638-40
 Hamborn, 482, 484-6
 Hamburg, 118, 171-2, 242, 260-5, 280-2,
 516-27
 hinterland, 275-80
 industries, 262
 inland traffic, 263
 transit trade, 265, 276
 trade, 276
 Hamburg-Amerika Line, 262
 hamlets, 136, 138-9, 146
 Hameln, 505
 Hamm, 172, 478, 489
 handicrafts, 227-8
 Hanover, 172, 282, 509-10
 kingdom of, 334, 509
 Hansa Canal, 535-6
 Hanseatic League, 94, 264, 611
 foundation of, 328
 Hapsburgs, *see* Habsburgs
 harbour works at Bremen, 529
 at Hamburg, 522-3
 Harburg, 517, 521
 Hardenberg, 345-6, 359
 Hardt, 537-9
 Harz, 38-9, 635-6
 Harz Foreland, 637
 Haufendorfer, 133-4, 137, 144
 Havel, 646-50
 Havelland, 650
 health resorts, 505
 heath, 75-7, 494-501, 652-4
 heath, bog and barren land, 207
 heavy engineering, 241-2
 Heidelberg, 172, 547
 Heilbronn, 566, 568
 Hellweg, 476-8, 486, 488, 504-5
 Helmstedt, 507
 hemp, 228
 Hereditary Farms Law, 214-15
 Herford, 505
 herrings in Baltic, 264
 Hesse, 337, 340, 511-15
 Hesse-Nassau, 337
 Hessian Corridor, 511
 High German, 310, 312-15
 High Taunus, 456-7
 Highlands and Lowlands of Hesse, 40
 Hildesheim, 504, 507

- hilly land, 408, 410
- Hindenburg, 172
- hinterlands of ports, 274-80
- Historische Landschaft, 426-7
- Hitler, 194
 - Government, 214-15, 311
- Hof, 583
- Hohle Eifel, 444
- Hohenstaufen Line, 326-7, 332
- Hohenzollern Canal, 618
- Hohenzollerns, 340, 349, 646
- Hohes Venn, 442-3
- Holy Roman Empire, 319-20, 322-3, 332-4
- housing problem, 373, 380-4, 611, 614
 - see also bomb damage
- Hufendorfer, 141-2, 146
- human units, 418-19
- humidity, summer, 59
- Hungary, 320
- Hunsruck, 428-9, 455-6
- Hussites, 317, 352
- hydro-electricity, 236-7, 601
- ice and navigation, 61, 257
 - sheets, 21, 30
- I.G. Farben, 230
- Iller, 586
 - valley, 590-1
- Iller-Lech Plateau, 590-2
- Imperial Cities, 332
- import tables, 290-1
 - tonnages, 289
 - values, 288-90
 - trade of S.E. Europe, table, 294
- imports, 260-5, 288 ff.
 - of foodstuffs, 288-92, 303-4, 396
 - of raw materials, 289-92
 - post-war, statistics, 389-9
- improvement of Elbe estuary, 517, 520-1, 523
 - of Rhine, 361, 464
 - of Weser estuary, 529
- industrial alcohol, 250
 - concerns, tables, 231-2
 - distribution in Ruhr, 483-5
 - employment, tables, 231-2
 - magnates, 344-6, 360-1
 - output of W. Germany, tables, 397-9
 - of zones, 399
 - population, 195-201, 233
 - production, 105, 193-4
 - in 1936, 385-6
 - since 1945, 371 ff.
 - surpluses, pre-war, 385-6
 - post-war, 387-8
- industrialization, 110-11, 198-200, 229
- industries, 240 ff.
 - of Bavarian Plateau, 592 ff.
 - of Berlin, 661, 664
 - of Brandenburg, 647 ff.
 - of Central Germany, 620 ff.
 - of Hesse, 513-15
 - of the Lower Rhineland, 469 ff.
 - of Lower Saxony, 504 ff.
 - industries, of the Nordmark, 608 ff.
 - of the Rhine Massif, 438 ff.
 - of the South German Scarplands, 568 ff.
 - of Southwest Germany, 547 ff.
- industry, in towns, 109-10, 169-70, 227
 - rural, 110, 114, 227-9
 - location of, 231 ff., 241-3
- inflation, 229
- Ingoldstadt, 590
- inland waterways, 251-3, 257-60; see also navigation
- Inn, 586
 - terraces, 592
- integration of industry, 229, 241, 482
- internal trade in various commodities, 266-74
 - in 1936, 385-6
 - post-war, 386-8
- inter-regional trade, 384-8
- international trade in coal, 299-302
- International Steel Cartel, 230
- iron, 231, 240-4
- Iron Curtain, 392
- iron ore, 193-4, 227, 229, 237
 - export from Lorraine, 297, 390, 480
 - import, 239, 297, 390, 480
 - pre-war trade, 390
 - post-war trade, 391
 - production, 240-1
 - production figures, 239, 297
 - reserves, 452
- iron and steel production, map, 271
 - industry, 390-1, 398
- iron working in Rhine Massif, 439 ff.
- isolated farms, 139, 144, 148-55
- Jena, 245, 634
- Junkers, 143, 213, 333, 344, 346-7
- Jura, 42
- Jurassic rocks, 42
- jute, 248
- Kaiserslautern, 563
- Kaiserstuhl, 539, 541
- Karlsruhe, 172, 258, 547
- karst, 448, 450, 579-80, 632
- Kassel, 172, 515
- Kiel, 172, 608-11
- Kiel Canal, 252-3, 261, 610
- Klein Bürgertum, 346-7
- Kleve, 464-6
- Knüll, 515
- Koblenz, 172, 357, 429, 442
- Koblenz Basin, 441
- Königsberg, 172, 280
- Koog, 604-5
- Kottbus, 656
- Kraichgau, 538, 559-60
- Krebs, 308-9
- Krefeld, 172, 248, 472-3
- Kreise, 329, 334, 341-2
- Kreuznach, 563
- Krupps, 229, 231, 360-1
 - works, 482, 486-8

- Kulturboden, 310
 Kulturkampf, 344-5
- Lahn, 451, 456-9, 512, 515
 Lake Constance, 597-8
 Lake Upland of Mecklenburg, 614
 land-forms, map, 24-5
 land use, 202 ff.; *see also* agriculture
 categories, 406
 map, 204-5
 statistics, 202, 223-6
 and slope, 404-5
 as landscape element, 406
- Länder, 363-4, 368-71
 landscape, 403 ff.; *see also* terrain
 complex, 407
 elements, 404 ff.
 study, method, 411-16
 types, 404 ff.
 units, 402-4, 414 ff.
 examples, 411 ff.
- Landschaft, 426-7
 Landschaftseinheit, 414
 lava, 443-4
 lead, 239-40
 leagues of towns, 327-8
 leather, 249
 Lebensraum, 308
 Lech, 586
 valley, 590-1
 Leine, 502, 509
 valley, 504, 510
 Leine Uplands, 502
 Leipzig, 171-2, 285, 638-41
 Leuna works, 639
 Leverkusen, 469
 light engineering, 242-4
 lignite, 193, 233-5, 638-9, 641
 production, map, 270
 post-war, 373, 375, 398
 trade, 269-70
- Lille, 118, 122
 Limburg, 458
 Limburg Basin, 458
limes, 354, 357, 457, 514, 564
 limestone soil, 220, 574
 limits of cultivation, 212, 227
 linear villages, 146
 linen, 248
 liner traffic, 261
 linguistic barriers, 433-5
 changes, 312
 Lippe, 340, 466, 476
 Canal, 489
 literary language, 314-15
 lithology, 405
 livestock, 211
 farming, 217-19
 feed, imports, 289, 291, 303-4
 location of industry, 111, 231-50
 loess, 22, 33, 43-5, 220
 belt, 117, 120
 loessic soils, 68, 221-2
 distribution, *see* Ch. 17 onwards
 loessic soils and settlement, 74-5, 136
 Lorraine, iron ore, 193-4, 239-40, 297-8
 political changes, 336
 terrain, 537-8
 Low German, 312-14
 low plateau, 408, 410
 Lower Bavarian Upland, 588-9
 Lower Lusatia, 654-6
 Lower Rhine Lowland, 414
 Lower Rhine Plain, 34, 461-6
 Lower Rhine Region, 200
 Lower Rhineland, 34-5, 282-3
 terrain, 411-14
 Lower Rhinlands, 460-91
 Lower Saxony, 282, 337, 493-511
 Lowlands of Lower Saxony, 35-6
 Lübeck, 172, 252, 260, 611
 foundation, 166
 Luckenwalde, 649
 Ludwigshafen, 245-6, 284, 547-9
 Lüneburg, 500-1
 Lüneburg Heath, 497-501
 Lusatia, 338, 351, 626-7, 654-6
 Luther, 315, 317, 352, 357
 Luxembourg, 240, 241, 336, 390
- Maare, 444
 machinery and vehicle manufacture, 231, 244
 Magdeburg, 172, 260, 276, 507-8
 magnesium, 240
 Magyar lands, 121
 Magyars, defeat of, 355
 Main, 560-2, 574
 valley, 575-6
 Main-Neckar basin, 162, 354
 Mainz, 172, 258, 283, 551-2
 Mannheim, 172, 258, 547-9
 man-land relationships, 402 ff.
 in Neckar basin, 420-5
 manufactures, trade, 290-1
 marches, 351
 marchlands, 166
 margraves, 351
 marine engineering, 242
 market settlements, 157, 161, 163, 165, 494
 markets, 157, 164, 167
 public, 254
 marketing, 245
 Markgräferland, 539
 Marks, 324-6
 of Bavaria, 355
 of Prussia, 348-9
 Marschen, 26, 34-5, 217
 Marschufendorfer, 142, 146
 marsh, 81, 120, 408, 516
 Marshall Aid, 371-3
 meat, import, 303
 trade, 268-9
 Mecklenburg, 333, 338, 340, 612-16
 Meiningen, 575
 Meissner, 515
 mercantilism, 228
 merchant cities, 93, 157
 metal products, internal trade, 270-3

metal working, 227-8, 231, 233, 237 ff.

Meuse, 38, 460-1

Middle Elbe Region, 200

Middle Franconian Basin, 576-7

Middle German, 312, 314

Middle Mark Lowland, 646-52

Middle Rhine, 283

Middle Rhine Region, 201, 249

million-cities, 118

Minden, 505

mineral springs, 505, 552

minerals, *see* mining

mining, 110, 231, 233, 237-47

 medieval, 107, 170

 in Central Germany, 620 ff.

 in Harz, 636

 in Lüneburg Heath, 500

 in Rhine Massif, 438 ff.

 in Saxony, 350-1

mining settlements, 91, 93, 227, 622, 636

Mitteldeutschland, 285, 619-44

Mittleuropa, 308

Mittelgebirge, 35, 37

Mittelland Canal, 258, 509-10, 534

Mittelmark, 646-52

mixed farming, 208, 217

Moerser Land, 411-14

Molasse, 20, 46, 585

Montabaur, 453-4

Montgelas, 356

moor, 77, 494-7

Moore, 217-18

Moorkolonien, 496

moraine, 31-2

Morainic Country between Iller and Lech,

 596-7

 of Lake Constance Area, 597-8

 of Upper Bavaria, 595-6

Moravia, 338-9

morphology of towns, 182-9

 of Berlin, 656-63

 of Bremen, 530-3

 of Cologne, 469-71

 of Duisburg, 485-6

 of Essen, 486-8

 of Frankfurt, 552-4

 of Hamburg, 524-6

 of Hanover, 509-10

 of Munich, 593-5

Moselle, 115, 442, 537-8

 regime, 61

 valley, 447-8

Mühhausen, 546

Mülheim, 482, 491-2

München-Gladbach, 472-3

Munich, 171-2, 284, 357, 593-5

Munich Plain, 592-3

Münster, 172, 475

Münster Bay, 476-7

Murg, 556-7

Muschelkalk, 45, 69, 203

Nagelfluh, 585

Nahe, 455, 563

Napoleon, 332-3

Napoleonic regime, 339, 341, 347, 358

 Wars, 251, 253, 264, 332-3, 355

national self-sufficiency, 195, 289

nationalism, 306, 317, 343, 359

natural regions, definition, 81

 table, 84-5

 resources, map, 234

 terrain, 403

 units, 417-18

 vegetation, 53-4, 72-81, 405; *see also*

 Ch. 17 onwards

 navigable waterways, 251-3, 257-60

navigation on Danube, 589

 on Elbe, 252-3, 258-60, 276

 on Neckar, 258, 561

 on Oder, 260

 on Rhine, 241, 253, 298, 359-60, 543-4, 546

 on Saale, 260, 642

 on Weser, 258, 535

Nazis, 306, 308

 administrative changes by, 362-3, 365-6

 land reforms by, 346, 348

Neckar, 560-2, 568

 Basin, 566-75

 settlement in, 420-5

 navigation, 258, 561

 Scarplands, *see* Swabian Scarplands

Nehrungen, 26, 614

Neisse, 626-7

Neolithic times, 72-5, 80, 90, 133

Netherlands States, 336

Neuss, 472

nickel, 240

nitrogen, 230, 245-6

non-ferrous metals, 239-40, 398

 ore production, 239-40

Nordic people, 312

 stock, 315-16

Norddeutsche Lloyd, 528

Nördlingen, 579-80

Nordmark, 280-2, 603-18

North Atlantic Treaty Organization,

 392-3

North German Confederation, 339

North German Lowland, 603-18

North Harz Lowland, 506-11

North Sea, 23, 26-8

 ports, 118, 260-5, Ch. 20

Northeast Lowlands, agriculture, 218-19,

 224

Northern Lowlands, 29 ff., 493-501

see also North German Lowland

Northwestern Lowlands, agriculture, 217-

 218, 224

 terrain, 414-17

nucleated village, 133-4

nuclei of states, 329-32, 348-57

 of towns, 156-7, 160, 176, 182-4; *see also*

 morphology

 of industrial towns, 170-1

 Nuremberg, Nürnberg, 172, 227, 284,

 577-8

- oats, 210
- Oberhausen, 172, 482, 489, 491-2
- Oberpfalz, 581-4
- Oberstdorf, 600
- Oberwesterwald, 453-4
- occupance, 418-19
 - pattern, 403
 - of Bavarian Plateau, 587 ff.
 - of Brandenburg, 646 ff.
 - of Central Germany, 620 ff.
 - of the Lower Rhineland, 464 ff.
 - of Lower Saxony and Hesse, 494 ff.
 - of the Nordmark, 604 ff.
 - of the Rhine Massif, 435 ff.
 - of the South German Scarplands, 566 ff.
 - of Southwest Germany, 537 ff.
- occupation by Allied Powers, 367 ff.
 - of Berlin, 664-5
 - of the Rhinelands, 347-8
 - of the Ruhr, 348, 482
- occupations, 196
 - post-war, 395
- Odenwald, 44, 139, 537-9, 560-2
- Oder, navigation, 260
 - Plain, 617
 - ports, 280
- Oder-Neisse line, 99
- oil imports, 289, 291
 - production, 235-6
- Old Uplands, 41
- Oldenburg, 340
- Oligocene deposits, 42
- Opel works, 244, 554-5
- open fields, 126, 131
- optical and precision instruments, 231, 244-5
- ore import, 289, 291-2, 297
- Osnabrück, 172, 505
- Ost Friesland, 533-4
- Ostmark, 355
- Outer Baltic Ridge, 36-7
- overseas trade, *see* trade, external
- Paderborn, 161, 164, 475-7
- Palatinate, 562-3; *see also* Pfalz, Pfälzer
- paper-making, 249
- partitions of Poland, 339
- Passau, 590
- passenger traffic, 257
- peasants, 130, 214, 219-20
 - emancipation, 132, 143
 - expropriation, 132
 - handicrafts, 227-8
 - and industrial work, 195-6
 - in Prussia, 345
- peat, 77, 81-2
 - bogs, 217
 - soil, 68
- peneplains, 43, 48
 - Pliocene, 539
 - pre-Pliocene, 39
 - pre-Triassic, 41-2
 - in Black Forest, 557
 - in Bohemian Forest, 582
 - peneplains, in Lower Rhineland, 473
 - in Rhine Massif, 39, 428 ff.
- periglacial deposits, 33
- Petersberg Agreement, 372
- Pfalz, 340
- Pfälzer Bergland, 45, 538, 563
 - Gebruch, 45
 - Wald, 45, 562-3
- Pforzheim, 284, 558, 560
- physical elements of landscape, 404-7, 416-18
 - units of Germany, map, 82-3
 - of W. Germany, 416-18
- physiographic units, 416
- pig iron, 193-4, 240-1
 - pre-war trade, 390
 - production, 297, 398
- pigs, 211
- pirates, 520, 533-4
- Pirmasens, 249, 562
- place-names, 133, 138, 142-3; *see also* Ch. 17 onwards
- plant ecology, 405
 - examples, 412-17
- plateau terrain, 408-11
- Platzdörfer, 142, 146
- Plauen, 172, 623
- ploughs, 126
- podsol, 67, 69
- Poland, 287, 320, 378
 - coal output, 300
- polders, 81, 120, 217, 408, 464, 495
- political disintegration, 326-7
 - geography, groupings, 319 ff.
 - of early Middle Ages, 322-6
 - of late Middle Ages, 326-9
 - in 1790, 329-33
 - in 1815, 333-5
 - in 1871, 339-40
 - in 1933, 361-2
 - in 1939, 340, 368
 - under Nazis, 362-3
 - since 1945, 367-70
 - interests, 346-7
 - parties, 347
- politico-cultural units, 322 ff.
 - minor, 425-7
- politico-geographical units, 322 ff.
- Pomerania, 333, 338, 349, 614-17
- and East Prussia, 280
- population, 96-105
 - densities in Europe, 286-8
 - density, 98-9
 - belts of, 115
 - in Ruhr, 492
 - distributional changes, 119-22, 195
 - increases since 1939, 380-1
 - maps, 107, 109, 112-13, 116-17, 120
 - occupations, 196
 - post-war changes, 98-9
 - problem, 378-84
 - transfer, 98-9
 - trends, 99-105
 - urban, 97, 169

- population, in Holy Roman Empire, 169
 - in Middle Ages, 94, 126-7
 - in seventeenth century, 95
 - in early nineteenth century, 106-10
 - in early twentieth century, 110-18
 - of Berlin, 662
 - of conurbations, 172
 - of European States, 96, 102
 - of Ruhr, tables, 491-2
 - of W. Germany, table, 394
- port of Bremen, 527-33
 - of Emden, 533-6
 - of Hamburg, 516-27
- ports, 260-5
 - direction of trade, 263
 - goods traffic, 263
 - hinterlands of, 274-80
 - of Baltic, Ch. 24
 - of North Sea, Ch. 20
- Posen, 339
- post-war recovery, 373 ff.
 - in the Ruhr, 490
- potash, 240, 245-6, 249, 544, 637
- potatoes, 210, 250
- Potsdam Agreement, 367, 371, 378
- Potsdam Germany, statistics, 376-7, 379, 394-9
- pottery, 249, 454
- power, 233-7
- Prague, 118, 260
- preferential freight rates, 275-6, 279
- prehistoric settlement, 435, 545, 559, 574, 577, 579, 606, 633
- Preuss, 363
- Protestantism, 317, 319
- provinces, 333-6, 361-2
- provincial groupings, 364-5
- Prussia, 132
 - growth, 329, 332-4, 337-41, 348-50
 - reforms in, 333
 - status, 361
- Prussianization, 345-6
- quarrying, 231, 233
- Quedlinburg, 507
- racial characters, 315-17
 - type, 312, 315-17
- railway density, 255-6
 - engineering, 242
 - era, 253
 - goods traffic, map, 255
 - passenger traffic, map, 256
 - traffic tonnage, 257
 - transit traffic, 278-9
- railways, 111, 193, 255-7
- rainfall, 56-60
 - and agriculture, 58-60
 - statistics, 65-6
- Rathenow, 650-1
- Ravensburg, 599
- raw materials, trade, 289-92
- rayon, 230, 248
- Recent deposits, 22
- reclamation, 33-4, 81, 95, 495-7, 604-5
- Reformation, 317
- refugees, 99, 373, 378-9, 382
- Regensburg, 589-90
- regional organization, 364-6
- regionalism, 343 ff.
 - pre-war, 361-6
- rehabilitation, 372
- Reich, 308-10, 319-22
 - administration, 363-6
 - boundaries, 320-2, 339
 - First, 319
 - Second, 319, 339-40
 - Third, 319
- Reich Coal Federation, 230
- Reichenbach, 623
- Reichsboden, 310, 319-22
- Reichstag, 347
- relief, Ch. 2
 - as landscape element, 404-5
 - of Bavarian Plateau, 585 ff.
 - of Brandenburg, 645 ff.
 - of Central Germany, 619 ff.
 - of the Lower Rhineland, 460 ff.
 - of Lower Saxony and Hesse, 493 ff.
 - of the Nordmark, 604 ff.
 - of the Rhine Massif, 428 ff.
 - of the South German Scarplands, 564 ff.
 - of Southwest Germany, 537 ff.
- relief elements of Central Europe, map, 16
- religion, 317-19
- Remscheid, 172, 449
- rendzina, 68-9
- revaluation, 372, 665
- Rheinhausen, 486
- Rheinisch-Westfälisch Kohlen Syndikat, 230
- Rhenish Confederation, 333
 - Convention, 358
- Rhine bridges, 468, 470
 - gorge, 165, 440-1
 - graben, *see* Rhine Rift
 - inland ports, 298
 - lands, economic unity, 298
 - League, 328
 - Massif, 37-9, 119, 428-59
 - navigation, 241, 253, 298, 359-60, 543-4, 546
 - Plateau, terrain, 410; *see also* Rhine Massif
 - regime, 61
 - Rift, 20, 40-3, 131, 537, 539; *see also* Upper Rhine Plain
 - terraces, 34-5, 461, 464-5, 542-3, 545
 - terrain of, 411-14, 440-2
 - traffic, 258, 274-5, 277-8, 283-4, 298, 486
 - as barrier, 360
- Rhine-Herne Canal, 482, 485-6, 488
- Rhine-Hesse Upland, 542
- Rhine-Marne Canal, 297
- Rhine-Rhône Canal, 298
- Rhineland, 115, 157, 282-3, 350, 357-61
 - medieval trade, 359
- Rhön, 513-14

- Riede, 542, 544
 Ries, 579-80
 Ringbahn, 659-63
 Ritter, 307
 river navigation, 252-3, 257-60; *see also*
 navigation
 regimes, 60-1; table, 66
 traffic, 486, 554-5
 transport, 241, 245, 257-60
 roads, 251-2, 257
 building of, 252
 rock and soil, 405
 Rodungszeit, 73, 75, 91-2, 138, 435
 Roman Catholic Church, 344-7
 Roman fortifications, 354, 357, 457, 514
 roads, 455, 466, 473-4, 560
 settlement, 157, 468-9, 472, 544, 547,
 559, 589
 Romantic movement, 357
 Rostock, 616
 rotation systems, 128-9, 215-22
 Rothaargebirge, 451
 Rotterdam, 260-1, 277-8
 hinterland, 274, 278
 routes, 255-60
 early medieval, 158-9, 160-2
 medieval, 175
 late medieval, 161-4, 170
 overland, 108-9, 114
 and towns, Ch. 7
 rubber industry, 247
 Rügen, 616-17
 rugged highland, 410
 Ruhr, 233, 240-2
 coal export, 283-4
 coalfield, output, 299
 export from, 297-8
 iron ore import, 297
 post-war situation, 490-1
 Ruhr District, 478-85
 cities of, 495-90
 population, 491-2
 traffic, 257-8
 Ruhrort, 482, 484-6
 Ruhrort-Mülheim Ship Canal, 482
 Rundling, 142, 146
 Rundplatzdörfer, 142
 rural depopulation, 132
 economy, 128-32, 211-22; *see also under*
 agriculture
 settlement, classification, 144-6
 forms, 125-8, 133-55
 post-medieval, 143-4
 types, map, 144
 as landscape element, 406
 in Bavarian Plateau, 587 ff.
 in Brandenburg, 646 ff.
 in Central Germany, 622 ff.
 in Hesse, 511 ff.
 in the Neckar Basin, 420-5
 in the Nordmark, 607 ff.
 in the Lower Rhineland, 464 ff.
 in Lower Saxony, 493 ff.
 in the Rhine Massif, 437 ff.
 rural settlement, in the South German
 Scarplands, 566 ff.
 in Southwest Germany, 537 ff.
 Rüsselheim, 554-5
 Russian control in east, 348, 373 ff.
 rye, 129, 134, 210

 Saale, 619, 632
 navigation, 260, 642
 Saar, 200-1, 233, 366
 Basin, 115, 119
 Saar-Nahe Upland, *see* Pfälzer Bergland
 St. Gotthard Pass, 545
 salt, 245-6, 500-1, 507, 510, 514, 602, 637
 Salzbach, 586, 592, 596
 Salzburg, 596
 Salzgau, 602
 Salzgitter, 507
 sample trading, 254
 Sandr, 32, 614, 647, 652-5
 Sauerland, 35, 429-50
 Saxon Elbeland, 625
 Highland, 621-3
 Lowland, 637-40
 Upland, 624-5
 Saxons, 90-1, 504
 Saxony, 248-9, 285, 340, 619 ff.
 dukedom, 337
 growth of, 329, 332-4, 350-3
 kingdom, 338, 619
 province, 338
 Slav duchy, 351
 Scandinavian trade, 264
 Schiefergebirge, 428 ff.
 Schleswig, 609
 Schleswig-Holstein, 519, 603-14
 Schnee Eifel, 443
 Schotter, 33, 46
 Schuman Plan, 231, 388-91
 Schweinfurt, 575
 Schwerin, 616
 scrap metal, 391
 Separated Areas, 367-9, 385, 387, 399
 secondary dispersion, 134
 secularization, 333
 Seenplatte, 614
 Selb, 584
 semi-processed materials, trade, 290-1
 Semmering Pass, 296
 settlement, 111
 early, 72-6, 88, 90-5; *see also* prehistoric
 settlement
 frontiers, 92-3, 98
 limits, 88
 phases, 133
 rural, *see* rural settlement, village
 structure in Neckar Basin, 420-5
 urban, *see* towns
 sheep, 211
 shifting cultivation, 128, 131, 139
 shipbuilding, 242
 shipping tonnages, 261, 264-5
 Siebengebirge, 451
 Sieg, 453-4

- Siegen, 452
 Siegerland, 228, 239, 241, 451-2
 Sietland, 516
 Silesia, 102, 284-5, 333, 336
 conquest of, 349
 silk, 248
 silver, 227
 Simmern, 455
 sites, 403, 412, 414-16, 421
 of towns, 161-4, 167, 177-82; *see also*
 morphology
 skull form, 315-17
 Slav lands, 311
 settlement, 139-43
 states, 104
 Slavs, 90-2, 104, 166, 349
 slope categories, 404-5
 and land use, 404-5
 smelting, 239-41
 snow, 58, 60, 66
 soap making, 250
 Social Democrats, 344, 347, 352
 social reforms, 344-8
 Soest, 164, 478
 soil categories, 405
 texture, 405
 type, local, 405
 as indicator of terrain, 405
 soils, 67-72, 107, 110
 and agriculture, 211 ff.
 and climate, 222
 and early settlement, 133
 and natural vegetation, 76-7, 80-1
 Solingen, 172, 449
 Solling, 504
 Sonneberg, 575, 630
 South German Scarplands, 45, 564-84
 South German Lands, agriculture, 220-6
 Southern Germany, geological structure,
 41-3
 rural settlement, 138
 Southwest Germany, 283, 537-63
 sovereign states, late medieval, 327
 Soviet Military Administration, 369
 Spandau, 650-1
 Spessart, 537-8, 560-2
 spinning, 228
 Sprachboden, 309, 315
 Spree, 657, 659
 squatter settlement, 136
 Stadlandschaft, 406
 Stahlwerksverband, 230
 standardization of currency, 347
 Stassfurt, 240, 246, 507
 States' Conference, 362-3
 states, growth, 329 ff.
 in 1939, 340
 steam power, 229
 steel, 231, 233, 240-4
 production, 194, 229, 230-1, 240-1
 post-war, 372-3, 375, 391, 398
 Stein, 333, 345-6
 steppe, 75, 169
 Stettin, 172, 262-3, 280, 617-18
 Stettin, hinterland, 275, 277, 279-80
 stow, 403, 412, 415-16, 421
 Stralsund, 617
 Strasbourg, 297-8, 358, 546-7
 Strassendorfer, 141, 146
 Straubing, 589
 strip system, 126, 137, 141, 147, 219-20
 Strombau, 253, 360
 strongholds, 156, 161, 165, 494
 Sturm und Drang, 343
 Stuttgart, 172, 283, 425, 568-9
 Styria, 338
 sub-Boreal Period, 75, 133
 Sudetes, 247-8, 285
 sugar beet, 210, 508
 manufacture, 250
 Sundgau, 539-42
 surface cover, 405-6
 Swabia, 337, 537, 564-8, 578-81
 Swabian Alb, *see* Alb
 Jura, 564
 Scarplands, 564-8
 Swinemünde, 617
 Switzerland, 295
 syndicalism, 344
 synthetic fuel, 236-7
 textiles, 248-9
 tariff unions, 339
 Taunus, 428-9, 455-8
 Teltowland, 647-9
 temperature, 54-6
 tables, 64
 tenements, 484, 524, 659
 terraces, 39, 44, 461, 464-5; *see also* indi-
 vidual rivers
 terrain of, 411-14, 539, 542-3, 545
 terrain, 402 ff.
 areas, 407
 facet, 403, 405
 study, 403-4
 examples, 411-17
 types, classified, 408-11
 classified and mapped, 430-1, 462-3,
 498-9, 518-19, 540, 548, 550, 570,
 573, 612-13, 648
 unit, 403-4
 terrains of Bavarian Plateau, 585 ff.
 of Brandenburg, 645 ff.
 of Central Germany, 618 ff.
 of Hesse, 511 ff.
 of the Lower Rhinelands, 460 ff.
 of Lower Saxony, 494 ff.
 of the Nordmark, 605 ff.
 of the Rhine Massif, 429 ff.
 of the South German Scarplands, 564 ff.
 of Southwest Germany, 537 ff.
 territorial consolidation, 336-42
 Teutoburger Wald, 35, 504
 Teutonic Knights, 327-9
 languages, 312
 peoples, 312
 textile fibre import, 289-92
 industries, 227-8, 231, 233, 247-8

- textile industries, post-war, 373, 375
 production, 398
 thermal springs, 558
 Thirty Years' War, 95, 169, 171, 355
 three-course system, 128
 three-field system, 128, 130, 138, 141
 Thüringer Wald, *see* Thuringian Highlands
 Thuringia, 337-8, 340, 619, 627-35
 Thuringian Highlands, 38, 42, 628-30
 Lowland, 630-5
 Thyssen, 360-1
 works, 482
 tidal ranges, 27
 scour, 516, 533
 timber import, 291-2
 industry, 231
 tin, 227, 230, 240
 tobacco, 250
 topographic facets, 418
 tourism, 441, 451, 558, 599, 636
 town status, 162-3, 165, 466
 towns, 156 ff.
 classification, 174-6
 development, 107-10, 115-18, 156-7; *see*
 also Ch. 17 onwards; *see also* mor-
 phology, and individual towns
 destruction, *see* bomb damage
 foundation, 92-3, 163, 167
 functional types, 173-6
 functions, 164-7, 173-7
 growth, *see* towns, development
 in Middle Ages, 91-2, 94
 after 1860, 96
 medieval, 160-9, 175
 morphology of, 182-9; *see also* mor-
 phology
 post-medieval, 169-70
 siting, 161-4, 167, 177-82
 sizes, 171-2
 types, historic, 182-6
 as landscape elements, 406-7
 toy-making, 575, 629-30
 trade balance, 288
 of W. Germany, 374
 competition with U.K., 294-5
 direction, 290 ff., 399
 European, 292-6
 export, 260-5, 373-4, 387
 external, 289-302, 399
 flows, 365
 internal, 266-74
 in 1936, 385-6
 post-war, 386-8
 statistics, 289-91, 398-9
 structure, 254-5
 in agricultural produce, 303-4
 with various countries, 262-3, 292-5, 399
 of W. Germany, 373-4
 tract, 403, 414
 traffic arteries, 255-6
 flows, 276, 365
 of Berlin, 662-3
 transshipment, 522, 528, 535
 transit traffic, ports, 265
 transit traffic, rail, 257, 274, 278-9
 Rhine, 277-8
 water, 274-5
 transport in Ruhr, 482
 Trave, 611
 Treaty of Augsburg, 329
 of Basel, 332
 of Versailles, *see* World War I
 of Westphalia, 306
 Triassic rocks, 18, 42, 45
 tribes, confederations, 322
 languages, 312
 movement, 88, 312
 settlement, 90, 132
 tribal districts, 323
 Tribal Duchies and Marches, 323-6, 336
 map, 89
 Trier, 447-8
 Trizonia, 382
 tuff, 444
 two-course system, 128
 Ulm, 161-2, 592
 undulating land, 408, 410
 unemployment, 370-1, 373
 unification of Germany, 339-42, 360
 unions of towns, 327-8
 unit of terrain, 403-4
 United Provinces, 336, 358
 unity of Mitteldeutschland, 640-4
 universities, foundation, 345, 351, 355, 357
 Unterwesterwald, 453-4
 Upper Lusatia, 626-7
 Upper Palatinate Lowland, 581-4
 Upper Rhine Plain, 43-4, 162, 538-9
 Upper Silesia, 119, 194, 200-1, 233, 240,
 284
 coalfield, 299
 Upper Swabian-Bavarian Morainic Up-
 lands, 595-9
 urban growth, 170-2; *see also* towns
 habitat, 406
 landscape of Ruhr, 483-4, 492
 origins, 156-65, 167-8; *see also* towns
 plan, 176, 183
 population, 171-2
 settlement, *see* towns
 as landscape element, 406-7
 sites classified, 177-82
 terrain, 411
 urbanization, *see* towns, development
 in Europe, 286-8
 Urstromtäler, 32, 36, 495
 Vegesack, 528
 vegetation types, 405
 vehicle manufacture, 244
 Vereinigte Stahlwerke, 229, 488
 Vienna, 118, 162, 168
 foundation of, 355
 village community, 418
 functional unit, 418
 types, 144-7
 in Neckar Basin, 420-5

- Ville ridge, 466, 471-2
 vine, 131, 139, 220
 vineyards, 223-6
 Vogel, 363-4
 Vogelsberg, 38, 40, 512-13
 Vogtland, 623-4
 volcanic cones, 444, 454
 Volk, 308
 Volksboden, 310-11
 Voltaire, 357
 Voreifel, 444
 Vorpommern, 615-17
 Vosges, 41-2, 537-9
 vulcanicity, 512, 539, 579
- Walchenseewerk, 601
 Waldeck Upland, 458-9
 Waldenburg, 172
 Waldhufendorfer, 142, 146
 war with Austria, 339, 344
 with Denmark, 344
 with France, 339-40, 344
 Warnemünde, 616
 Warsaw, 118, 287
 water power, 228
 supply, 480, 653-4
 waterborne traffic, 257-60
 waterways, 253, 257-60; *see also* navigation
 Watten, 23, 81, 604
 weaving, 228-9
 Weimar, 634
 Constitution, 347, 362
 Republic, 363
 Wendish towns, 328
 Werra, 511-12, 515
 valley, 575-6
 Wesel, 464, 466
 Weser, 242, 502, 504, 527-30
 crossings, 161, 527
 estuary, 516
 navigation, 258, 535
 Weser Uplands, Weserbergland, 37-9, 493,
 501-6
 Wesermünde, 172, 530
 West German State, 369
 West Hesse Depression, 512, 514-15
 West Prussia, 333, 339
- Western Germany, agriculture, 396-7
 food import, 396
 foreign trade, 397-9
 industrial output, 397-9
 land use, 397
 post-war recovery, 373-4
 problems, 373
 Western Marshes, 604-5
 Westerwald, 429, 452-5
 Westphalia, 163-4, 282-3, 337, 350, 475-8
 Westphalian Lowland, 35, 475-8
 Uplands, 39
 Westphalian-Lippe Upland, 503-4
 Wetterau, 514
 Wettin dynasty, 351-2
 Wetzlar, 458
 wheat, 210
 Wiesbaden, 172, 552
 Wilhelmsburg, 523
 Wilhelmshaven, 496
 Winterberg, 451
 Wismar, 616
 Wittenberg, 654
 woodland, 76, 223-6
 wool, 228-9, 248
 import, 289-92
 World War I, 194, 197, 230, 241
 losses after, 194, 239
 World War II, 195, 197
 Wuppertal, 172, 449
 Württemberg, 201, 248, 340, 568
 growth, 329, 332-3
 settlement study, 420-5
 Würzburg, 172, 574-5
 Wüstungsdorf, 137
- Zabern, 538
 Pass, 44-5, 538
 Zauche, 647
 zinc, 239-40
 Zollverein, 193, 252, 339, 343, 360
 zones of occupation, 367 ff.
 production figures, 370, 394-9
 statistical comparison, 376-7, 379, 385-6,
 399
 Zwickau, 172, 352-3, 624